The Mount Sinai Hospital
1852
THE MOUNT SINAI SCHOOL OF MEDICINE
C U N Y
THE CITY UNIVERSITY OF NEW YORK
FOUNDED IN 1847
MOUNT SINAI MEDICAL CENTER

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MT. SINAI HOSPITAL REPORTS

VOLUME III

FOR 1901 AND 1902

EDITED FOR THE MEDICAL BOARD

BY

N. E. BRILL, A.M., M.D.

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On page 26, omit the word "Primary" in title.

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MEDICAL AND SURGICAL STAFF FOR 1901 AND 1902.

CONSULTING PHYSICIANS.

A. JACOBI, M.D. E. G. JANEWAY, M.D.

CONSULTING SURGEONS.

THOMAS M. MARKOE, M.D.* DANIEL M. STIMSON, M.D.

WILLIAM F. FLUHRER, M.D.

ATTENDING PHYSICIANS.

JULIUS RUDISCH, M.D. N. E. BRILL, M.D.

ALFRED MEYER, M.D. MORRIS MANGES, M.D.

HENRY KOPLIK, M.D.

(Diseases of Children.)

ATTENDING SURGEONS.

ARPAD G. GERSTER, M.D. HOWARD LILIENTHAL, M.D.

GYNECOLOGIST.

PAUL F. MUNDÉ, M.D.*

OPHTHALMIC AND AURAL SURGEON.

EMIL GRUENING, M.D.

ATTENDING DERMATOLOGIST.

S. LUSTGARTEN, M.D.

ATTENDING NEUROLOGIST.

B. SACHS, M.D.

ADJUNCT ATTENDING PHYSICIANS.

D. H. DAVISON, M.D. HENRY W. BERG, M.D.

HENRY HEIMAN, M.D.

(Diseases of Children.)

ADJUNCT ATTENDING SURGEONS.

CHARLES A. ELSBERG, M.D. A. V. MOSCHCOWITZ, M.D.

JOSEPH WIENER, JR., M.D. A. A. BERG, M.D.

ADJUNCT GYNECOLOGISTS.

JOSEPH BRETTAUER, M.D. HIRAM N. VINEBERG, M.D.

ADJUNCT OPHTHALMIC AND AURAL SURGEONS.

CHARLES H. MAY, M.D. CARL KOLLER, M.D.

ADJUNCT DERMATOLOGIST.

HERMAN GOLDENBERG, M.D.

PATHOLOGIST.

F. S. MANDLEBAUM, M.D.

ASSISTANT PATHOLOGIST.

E. LIBMAN, M.D.

ADMITTING PHYSICIAN.

MAX ROSENBERG, M.D.

RADIOGRAPHIST.

WALTER M. BRICKNER, M.D.

*Deceased.

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HOUSE STAFF.

From January 1 to June 30, 1901.

House Physician,
I. W. BECKER, M.D.

House Surgeon,
M. THORNER, M.D.

Senior Assistant Physician,
HERMAN B. SCHWARZ, M.D.

Senior Assistant Surgeon,
EDWIN BEER, M.D.

Junior Assistant Physician,
EDWARD A. ARONSON, M.D.

Junior Assistant Surgeon,
TRUMAN ABBE, M.D.

First Externe,
M. G. SEELIG, M.D.

First Externe,
MILTON GERSHEL, M.D.

Second Externe,
HERBERT L. CELLER, M.D.

Second Externe,
MEYER M. STARK, M.D.

Provisionals,
ELI MOSCHCOWITZ, M.D.
ROBERT T. FRANK, M.D.

Provisionals,
LEON BANDLER, M.D.
EUGENE P. BERNSTEIN, M.D.

From July 1 to December 31, 1901.

House Physician,
HERMAN B. SCHWARZ, M.D.

House Surgeon,
TRUMAN ABBE, M.D.

Senior Assistant Physician,
EDWARD A. ARONSON, M.D.

Senior Assistant Surgeon,
EDWIN BEER, M.D.

Junior Assistant Physician,
MILTON GERSHEL, M.D.

Junior Assistant Surgeon,
M. G. SEELIG, M.D.

First Externe,
MEYER M. STARK, M.D.

First Externe,
HERBERT L. CELLER, M.D.

Second Externe,
ROBERT T. FRANK, M.D.

Second Externe,
ALBERT F. HESS, M.D.

Provisionals,
SIG. S. GOLDWATER, M.D.
ARTHUR BOOKMAN, M.D.

Provisionals,
BERNARD S. OPPENHEIMER, M.D.
H. F. L. ZIEGEL, M.D.

HOUSE STAFF.

(Continued.)

From January 1 to June 30, 1902.

House Physician,
EDWARD A. ARONSON, M.D.

House Surgeon,
EDWIN BEER, M.D.

Senior Assistant Physician,
MILTON GERSHEL, M.D.

Senior Assistant Surgeon,
M. G. SEELIG, M.D.

Junior Assistant Physician,
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ROBERT T. FRANK, M.D.

First Externe,
ALBERT F. HESS, M.D.

Second Externe,
ELI MOSCHCOWITZ, M.D.

Second Externe,
DAVID KRAMER, M.D.

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Junior Assistant Physicians,
ALBERT F. HESS, M.D.
ELI MOSCHCOWITZ, M.D.

Junior Assistant Surgeons,
ROBERT T. FRANK, M.D.
H. F. L. ZIEGEL, M.D.

First Externes,
D. LEE HIRSCHLER, M.D.
FRED H. McCARTHY, M.D.

First Externes,
BERNARD S. OPPENHEIMER, M.D.
DAVID KRAMER, M.D.

Second Externes,
ARTHUR BOOKMAN, M.D.
LOUIS BAUMAN, M.D.

Second Externes,
SAMUEL FELDSTINE, M.D.
ALBERT G. SWIFT, M.D.

DEPARTMENT OF INTERNAL MEDICINE.

STATISTICS OF MEDICAL SERVICE DURING 1901.

JULIUS RUDISCH, M.D., NATHAN E. BRILL, M.D.,
ALFRED MEYER, M.D., MORRIS MANGES, M.D.

ATTENDING PHYSICIANS.

D. H. DAVISON, M.D., H. W. BERG, M.D.

ADJUNCT ATTENDING PHYSICIANS.

TOTAL OF ALL CASES.

Treated	907
Cured	405
Improved	346
Unimproved	43
Died	113

General Diseases.	Total.		Cured.		Improved.		Unimproved.		Died.	
	M	F	M	F	M	F	M	F	M	F
Alcoholism	1	..	..	..	1	..	..	..	..	..
" delirium tremens	1	..	1	..	..	..	..	..	..	..
Arthritis deformans	1	..	..	..	1	..	..	..	..	..
" gonorrheal	5	2	1	..	3	2	1	..	..	..
" tubercular	1	..	..	..	..	..	1	..	..	..
Carcinosis, general	1	1	..	..	..	..	..	..	1	1
Debility	1	2	1	1	..	1	..	..	..	..
Diabetes	1	1	..	..	1	1	..	..	..	..
" with pulmonary tuberculosis	1	..	..	..	1	..	..	..	..	..
Diphtheria	..	3	..	3	..	..	..	..	..	..
Exophthalmos with myopia and intestinal adhesions	..	1	..	..	..	1	..	..	..	..
Goitre	3	..	1	..	1	..	1	..	..	..
Influenza	19	7	19	7	..	..	..	..	..	..
" with chronic bronchitis	..	1	..	1	..	..	..	..	..	..
" " " mucous colitis	1	..	1	..	..	..	..	..	..	..
" " pneumonia	..	1	..	1	..	..	..	..	..	..
Insolation	6	1	6	1	..	..	..	..	..	..
" with gout	1	..	1	..	..	..	..	..	..	..
Malaria	6	2	5	2	1	..	..	..	..	..
Malnutrition	1	..	1	..	..	..	..	..	..	..
Rheumatism, acute articular	12	11	11	10	1	1	..	..	..	..
" " " with endocarditis and pneumonia	..	1	..	1	..	..	..	..	..	..
Rheumatism, acute articular, chronic endocarditis, pneumonia, and pericarditis	..	1	..	..	..	1	..	..	..	..
Rheumatism, acute articular, pleuritis sicca	1	..	1	..	..	..	..	..	..	..
" " " with streptococcemia	1	..	..	..	1	..	..	..	..	..

	Total.		Cured.		Improved.		Unimproved.		Died.	
	M	F	M	F	M	F	M	F	M	F
Rheumatism, subacute	12	8	8	7	4	..	..	1	..	..
" " with peliosis rheumatica.	..	1	..	1	..	..	..	..	..	..
" chronic	5	3	2	..	3	3	..	..	..	..
" " with endocarditis	..	1	..	..	..	1	..	..	..	..
" muscular	5	..	3	..	1	..	1	..	..	..
Lumbago	2	1	2	..	..	1	..	..	..	..
Scarlatina	1	..	1	..	..	..	..	..	..	..
Senility	..	2	..	..	..	2	..	..	..	..
Septicemia (streptococcuc); malignant endocarditis	1	..	..	..	..	..	..	..	1	..
Syphilis	1	1	1	..	..	..	..	..	..	1
Typhoid fever	54	32	47	31	..	..	1	..	6	1
" " with pneumonia	3	2	2	2	..	..	..	..	1	..
" " " pleurisy with effusion	..	1	..	1	..	..	..	..	..	..
" " " phlebitis	..	1	..	1	..	..	..	..	..	..
Total	148	88	115	70	19	14	5	1	9	3
Diseases of the Blood.										
Anemia, primary	..	1	..	..	..	1	..	..	..	..
" pernicious	1	..	..	..	..	..	1	..	..	..
" splenica	1	..	..	..	..	..	1	..	..	..
Chlorosis	..	2	..	1	..	1	..	..	..	..
Leukemia, acute	1	..	..	..	..	..	..	..	1	..
" chronic	1	..	..	..	..	..	1	..	..	..
Total	4	3	..	1	..	2	3	..	1	..
Diseases of the Digestive Tract.										
Abdominal sarcoma, metastatic	..	1	..	..	..	..	..	1	..	..
" tumor	3	2	..	..	2	2	1	..	..	..
Cholecystitis	1	2	1	1	..	..	..	1	..	..
Cholelithiasis	7	3	..	..	7	2	..	1	..	..
Colitis, acute serous	4	1	3	1	1	..	..	..	..	..
" chronic	4	..	3	..	1	..	..	..	..	..
" mucous	1	..	..	..	1	..	..	..	..	..
" ulcerative	7	1	6	1	1	..	..	..	..	..
Constipation	4	1	4	1	..	..	..	..	..	..
Dysentery, chronic	3	..	1	..	1	..	1	..	..	..
Emesis of pregnancy	..	5	..	3	..	1	..	..	..	1
Enteritis, chronic	1	1	..	..	..	1	1	..	..	..
Enteralgia	1	..	1	..	..	..	..	..	..	
Enterocolitis	1	..	..	..	1	..	..	..	..	..
Esophagus, tumor of	1	..	..	..	..	..	1	..	..	..
Gastritis, acute	1	4	1	4	..	..	..	..	..	..
" alcoholic	1	..	1	..	..	..	..	..	..	..
" subacute	4	3	4	2	..	1	..	..	..	..
" chronic	6	7	2	3	4	4	..	..	..	..
" atrophic	1	..	1	..	..	..	..	..	..	..
Gastroduodenitis	1	..	1	..	..	..	..	..	..	..
Gastroenteritis, acute	1	1	1	1	..	..	..	..	..	..

Diseases of the Digestive Tract—Continued.	Total		Cured.		Improved		Unimproved		Died.	
	M	F	M	F	M	F	M	F	M	F
Gastroenteritis, chronic	1						1			
Gingivitis	1		1							
Hepatitis, syphilitic	1		1							
Intestinal adhesions		1				1				
" auto-intoxication	5	3	5	3						
Liver, carcinoma of	4	1					1		3	1
" sarcoma of	1	1						1	1	
" hypertrophic cirrhosis	1				1					
Peritonitis; rupture liver abscess	1								1	
Pharyngitis	1		1							
Rectum, carcinoma of	1								1	
Sigmoid, " "	1				1					
Stomach and liver, carcinoma of	1	1			1					1
" carcinoma of	5	2			3			1		1
" ulcer of		2		2						
Spleen, tumor of, with hemorrhagic pleurisy	1				1					
Splenomegaly	1				1					
Tonsillitis, follicular	2	2	2	2						
" suppurative	2		2							
Total	83	45	42	24	29	12	6	5	6	4
Diseases of the Respiratory Tract.										
Abscess of lung		3		1		1				1
" " " with pulmonary tuberculosis		1				1				
Bronchitis, acute	1	2	1	2						
" chronic	1	1			1	1				
" " with pleurisy		1		1						
Bronchorrhea		1				1				
Coryza		1		1						
Empyema		1							1	
Epistaxis	2		2							
Emphysema	2		1		1					
" with bronchitis	23	6	2	2	20	4	1			
Hemothorax	1		1							
Laryngitis, acute catarrhal	1		1							
Mediastinum, tumor of	1								1	
Miliary tuberculosis, acute general	1								1	
Pleurisy, chronic		1				1				
" dry	5	2	5	1		1				
" with effusion	5	5	5	1	4					
Pneumonia, acute lobar	31	17	24	15					7	2
" " with pleural effusion	2		1		1					
" broncho	4	2	1	1	1				2	1
" resolvans	2		2							
" septic	1	1		1					1	
" with gangrene of lung	1								1	
" chronic, with bronchiectasis	1				1					
Pneumothorax; emphysema; bronchitis	1		1							
Pyopneumothorax	1								1	
Tuberculosis pulmonalis	34	14			28	11	1	1	5	2

	Total.		Cured.		Improved.		Unimproved.		Died.	
Diseases of the Respiratory Tract—*Continued.*	M	F	M	F	M	F	M	F	M	F
Tuberculosis incipiens	1	2	..	..	1	2	..	..	..	..
" subacute miliary	1	..	..	..	..	..	..	..	1	..
" pulmonalis with tubercular enteritis	..	1	..	..	..	..	..	..	..	1
" pulmonalis with diabetes	1	..	..	..	..	..	..	..	1	..
" " " pyopneumothorax, peritonitis, enteritis	..	1	..	..	1	..	..	..	..	..
" pulmonalis with Pott's disease	2	..	..	..	2	..	..	..	..	..
" " " pleurisy with effusion	2	..	..	..	2	..	..	..	..	..
" pulmonalis with laryngitis	1	..	..	..	..	..	..	..	1	..
Total	19	63	47	26	63	23	2	1	23	7
Diseases of the Circulatory System.										
Aneurism of arch of aorta	2	..	..	..	1	..	..	..	1	..
Endarteritis	2	..	..	..	2	..	..	..	..	..
Endocarditis, acute	3	..	..	..	1	..	1	..	1	..
" chronic	39	20	4	1	25	16	2	0	8	3
" with nephritis	6	2	..	..	2	1	1	..	3	1
" " pulmonary thrombosis	1	..	..	..	..	..	..	..	1	..
" malignant	1	1	..	..	..	..	1	..	..	1
Myocarditis	6	0	..	..	5	..	1	..	..	..
" with chronic nephritis	1	..	..	..	..	..	..	..	1	..
" " " endocarditis	1	2	..	..	..	2	..	..	1	..
Pericarditis	2	1	1	1	1	..	..	..	..	..
Venous thrombosis	..	1	..	..	..	..	..	..	1	..
Total	64	27	5	2	37	19	6	0	17	5
Diseases of the Nervous System.										
Acromegaly; diabetes; pulmonary tuberculosis	..	1	..	..	..	1	..	..	..	..
Amyotrophic lateral sclerosis	1	..	..	..	..	..	1	..	..	..
Cerebral embolus	1	2	..	..	1	2	..	..	..	..
" hemorrhage	9	..	..	..	5	..	..	..	4	..
" syphilis	1	2	..	..	1	..	..	..	..	2
Chorea	1	2	..	2	1	..	..	..	..	..
Dementia	1	2	..	..	1	1	..	1	..	..
Diffuse myelitis	2	..	..	..	2	..	..	..	..	..
Disseminated multiple sclerosis	2	..	1	..	1	..	..	..	..	..
Epilepsy	2	1	..	..	..	..	2	1	..	..
Hysteria	4	9	2	5	2	4	..	..	..	..
Landry's paralysis	1	..	..	..	..	..	..	..	1	..
Melancholia	1	1	..	..	..	1	1	..	..	..
Meningitis; cavernous sinus thrombosis	..	1	..	..	..	..	..	..	..	1
" chronic	1	..	..	..	..	..	..	..	1	..
" syphilitic	2	..	..	..	2	..	..	..	..	..
" tubercular	2	..	..	..	..	..	..	..	2	..
Myalgia paresthetica	..	1	..	..	..	1	..	..	..	..
Neuralgia, intercostal	2	..	1	..	1	..	..	..	..	..
" trifacial	1	..	..	..	1	..	..	..	..	..

	Total.		Cured		Improved		Unimproved		Died.	
Diseases of the Nervous System—*Continued*	M	F	M	F	M	F	M	F	M	F
Neurasthenia	22	24	12	12	9	10	1	2	..	..
Neuritis, alcoholic	1	..	..	..	1	..	..	..	..	..
" brachial	2	..	..	..	2	..	..	..	..	..
" typhoid	..	1	..	..	..	1	..	..	..	..
Psychoses of pregnancy	..	1	..	1	..	..	..	..	..	..
Sciatica	18	4	10	2	7	2	1	..	..	..
Singultus following cerebral embolus	1	..	..	..	..	..	..	..	1	..
Spinal hemorrhage	1	..	1	..	..	..	..	..	..	..
Tabes dorsalis	2	..	..	..	1	..	..	..	1	..
Tumors, cerebellar	2	1	..	..	1	..	..	..	1	1
" cord	2	..	..	..	1	..	..	..	1	..
Typhoid spine	1	..	1	..	..	..	..	..	..	..
Total	86	53	28	22	40	23	6	4	12	4
Poisons.										
Chloroform narcosis	..	1	..	..	..	..	..	..	..	1
Plumbism	7	..	5	..	2	..	..	..	..	..
Total	7	1	5	..	2	..	..	..	..	1
Surgical Diseases.										
Contusion of chest	1	..	1	..	..	..	..	..	..	..
Kidney, malignant tumor of	..	1	..	..	..	1	..	..	..	..
Pyonephrosis	..	1	..	..	..	1	..	..	..	..
" and pulmonary embolism	..	1	..	..	..	..	..	..	..	1
Salpingitis, acute	..	1	..	1	..	..	..	..	..	..
Tuberculosis of knee	..	1	..	..	..	1	..	..	..	..
Total	1	5	1	1	..	3	..	..	..	1
Cutaneous Diseases.										
Dermatitis	1	..	1	..	..	..	..	..	..	..
" herpetiformis	..	1	..	1	..	..	..	..	..	..
Eczema	7	..	4	..	3	..	..	..	..	..
Erythema multiforme	..	1	..	..	..	1	..	..	..	..
" acute infectious, with visceral lesions	1	..	..	..	1	..	..	..	..	..
" toxic	2	..	2	..	..	..	..	..	..	..
" nodosum	1	..	1	..	..	..	..	..	..	..
" from auto-intoxication	1	..	1	..	..	..	..	..	..	..
" acute infectious	..	1	..	1	..	..	..	..	..	..
Pemphigus vegetans, pneumonia	1	..	..	..	..	..	..	..	1	..
Purpura hemorrhagica, with tumor of abdomen	..	1	..	..	..	1	..	..	..	..
Total	11	4	9	2	4	2	..	..	1	..
Genitourinary Diseases.										
Cystinuria	3	..	..	..	3[1]	..	..	..	..	..
Cystitis, chronic	..	1	..	..	..	1	..	..	..	..
" and pyelitis	1	..	..	..	1	..	..	..	..	..
Epididymo-orchitis	1	..	1	..	..	..	..	..	..	..
Hematuria	1	..	..	..	..	..	1	..	..	..

Genitourinary Diseases—*Continued.*	Total.		Cured.		Improved.		Unimproved.		Died	
	M	F	M	F	M	F	M	F	M	F
Nephritis, acute	3	2	2	..	..	1	..	..	1	1
" chronic	39	17	..	..	26	14	2	1	11	2
" " with bronchopneumonia	2	..	..	..	..	..	..	..	2	..
" " " pneumonia	1	..	..	..	..	..	..	..	1	..
" " sciatica, renal calculus (?)	..	1	..	..	..	1	..	..	..	..
Nephrolithiasis	4	1	1	..	3	1	..	..	..	..
Oliguria	..	1	..	..	..	..	..	..	..	1
Orchitis following parotitis	1	..	1	..	..	..	..	..	..	..
Prostatic hypertrophy	1	..	..	..	1	..	..	..	..	..
Ren mobilis	1	..	..	..	1	..	..	..	..	..
Uremia	1	..	..	..	1	..	..	..	..	..
Total	59	23	5	..	36	18	3	1	15	4

[1]One case treated three times.

STATISTICS OF MEDICAL SERVICE DURING 1902.

TOTAL OF ALL CASES.

Treated	857
Cured	355
Improved	352
Unimproved	35
Died	115

	General Diseases.	Total.		Cured.		Improved.		Unimproved.		Died.	
		M	F	M	F	M	F	M	F	M	F
A.	Diphtheria	3	6	3	6	..	..	..	..	..	..
	Influenza	13	7	13	7	..	..	..	..	..	..
	Malaria	8	5	8	5	..	..	..	..	..	..
	Measles	..	1	..	1	..	..	..	..	..	..
	" and exophthalmic goitre	..	1	..	1	..	..	..	..	..	..
	" " pseudo-diphtheritic angina	..	1	..	..	..	..	..	..	..	1
	" " otitis media	..	1	..	1	..	..	..	..	..	..
	Tuberculosis, acute general miliary	1	..	..	..	..	..	..	..	1	..
	Typhoid fever	49	27	43	24	..	..	..	..	6	3
	" " with relapse	..	1	..	1	..	..	..	..	..	..
	" " " perforation of intestine	1	..	..	..	..	..	..	..	1	..
	" " " phlebitis	3	1	3	1	..	..	..	..	..	..
	" " " " and relapse	..	1	..	1	..	..	..	..	..	..
	Paratyphoid fever	2	..	2	..	..	..	..	..	..	..
B.	Acute infectious disease of unknown character	..	1	..	..	..	..	..	..	..	1
	Arthritis, gonorrheal	2	..	2	..	..	..	..	..	..	..
	" deformans	..	2	..	..	..	1	..	1	..	..

General Diseases—*Continued.*	Total		Cured.		Improved		Unimproved.		Died.	
	M	F	M	F	M	F	M	F	M	F
Carcinosis, general	1								1	
Diabetes mellitus	1	3				2			1	1
" " and acromegaly		1								1
" " " hemiplegia	1				1					
" " " pleurisy		1						1		
Peliosis rheumatica	1				1					
Rheumatism, acute articular	10	7	9	6	1	1				
" " " with erythema multiforme	1		1							
Rheumatism, acute articular, with endocarditis	1		1							
Rheumatism, acute articular, with pericarditis	1		1							
Rheumatism, acute articular, with pleuritis sicca		1		1						
Rheumatism, subacute articular	12	8	11	6	1	1		1		
" " " with otitis media	1		1							
Rheumatism, chronic	9	6	2	2	7	4				
" " with endocarditis	3				3					
" " " " and pericarditis	1				1					
Sarcomata, multiple	1				1					
Septicemia, cryptogenetic	1								1	
Sepsis, puerperal		1								1
Syphilis	2				2					
" secondary	1				1					
Total	130	81	106	63	19	8		3	11	8
Diseases of the Digestive Tract.										
Biliary colic	1		1							
Cholecystitis	5	3	5	3						
Cholelithiasis		2		1		1				
" and cholecystitis	1	1	1	1						
Colitis, acute catarrhal	5	1	4	1	1					
" chronic	2		1		1					
" ulcerative	1		1							
Constipation	7	3	7	3						
Dysentery, chronic	1				1					
Enteritis, tubercular	1				1					
Enteralgia	2		2							
Enterocolitis	1				1					
Enteroptosis		1				1				
Gastric dyspepsia	1		1							
Gastritis, acute	1		1							
" subacute		1		1						
" chronic	5	2		1	5	1				
" alcoholic	1		1							
Gastroenteritis, acute	1		1							
Hemorrhoids		1						1		
Hepatic fever	1				1					

	Total.		Cured.		Improved.		Unimproved.		Died.	
Diseases of the Digestive Tract—*Continued.*	M	F	M	F	M	F	M	F	M	F
Intestinal auto-intoxication	10	2	10	2	..	..	..	..	..	..
Intestine, carcinoma of	2	..	1	..	..	..	..	..	1	..
Jaundice, catarrhal	1	..	1	..	..	..	..	..	..	..
Liver, carcinoma of	2	1	..	..	1	..	..	..	1	1
" cirrhosis of	2	..	..	..	2	..	..	..	..	..
" tumor of	1	2	..	..	..	1	1	..	..	1
Peritonitis, tubercular	..	2	..	..	..	1	..	..	..	1
Pylorus carcinoma	1	..	..	..	..	..	..	..	1	..
Rectum "	1	..	..	..	..	..	..	..	1	..
Stomach and liver carcinoma	2	1	..	..	2	..	..	..	..	1
" carcinoma of	4	3	..	..	1	1	2	2	1	..
" ulcer of	2	2	2	..	..	2	..	..	..	..
" tumor of	1	..	..	..	1	..	..	..	..	..
Tonsillitis, acute	1	..	1	..	..	..	..	..	..	..
" " follicular	4	1	4	1	..	..	..	..	..	..
" suppurative	..	1	..	1	..	..	..	..	..	..
Total	71	30	45	15	18	8	3	3	5	4
Diseases of the Respiratory Tract.										
Bronchitis, acute	..	1	..	1	..	..	..	..	..	..
" subacute	1	..	1	..	..	..	..	..	..	..
" chronic	2	1	..	..	1	1	1	..	..	..
" " with nephritis	1	..	..	..	1	..	..	..	..	..
" septic	..	1	..	1	..	..	..	..	..	..
Bronchiectasis	2	..	..	..	1	..	1	..	..	..
Emphysema	1	..	..	..	..	..	..	..	1	..
" with bronchitis	22	7	..	..	20	6	..	..	2	1
Gangrene of lung	1	..	..	..	1	..	..	..	..	..
Laryngitis, acute catarrhal	1	..	1	..	..	..	..	..	..	..
Lung, tumor of	1	..	..	..	..	..	..	..	1	..
Pleura, tumor of	2	..	..	..	..	..	..	..	2	..
Pleurisy, dry	5	3	3	3	2	..	..	..	..	..
" with effusion	4	7	3	4	1	3	..	..	..	..
" interlobar effusion with pneumothorax	..	1	..	1	..	..	..	..	..	..
" traumatic	..	1	..	1	..	..	..	..	..	..
" tuberculous	3	1	..	1	3	..	..	..	..	..
Pneumonia, acute lobar	32	16	25	13	..	..	..	..	7	3
" broncho	1	..	1	..	..	..	..	..	..	..
Pneumothorax with pulmonary edema	1	..	..	..	..	..	..	..	1	..
Tuberculosis pulmonalis	33	10	..	..	29	9	..	..	4	1
" incipiens	..	1	..	..	..	1	..	..	..	..
Total	13	50	34	27	59	20	2	..	18	5
Diseases of Vessels.										
Aneurism of arch of aorta	2	..	..	..	1	..	1	..	..	..
" innominate	..	1	..	..	..	..	..	1	..	..
Aorta, stenosis congenital	1	..	..	..	..	..	..	..	1	..
Endarteritis	4	1	..	..	3	..	1	1	..	..
Total	7	2	..	..	4	..	2	2	1	..

	Total		Cured.		Improved		Unimproved		Died	
Diseases of the Heart.	M	F	M	F	M	F	M	F	M	F
Endocarditis, acute	1				1					
Chronic endocarditis	24	48			18	36	2	4	4	8
" " with angina pectoris	1				1					
" " " cirrhosis of liver	1				1					
" " " aortitis	1								1	
" " " chronic rheumatism	2	1			2	1				
" " and myocarditis	3	1			2				1	1
" " " " and endarteritis	1								1	
Chronic endocarditis and nephritis	6	5			3	3	1		2	2
" " " pericarditis	3	1			2	1			1	
Endocarditis, septic	3	1				1			3	
" ulcerative	2	3					1		1	3
" " with septicemia	1	1					1		1	
Myocarditis	3	7			1	6		1	2	
Total	52	68			31	48	5	5	17	14
Poisons.										
Alcoholism	1		1							
Carbolic acid		1		1						
Morphinism	1						1			
Plumbism	3		3							
" and lumbago	1		1							
Total	6	1	5	1			1			
Nervous Diseases.										
Cerebellar neoplasm		1		1						
Cerebral thrombosis		1				1				
Chorea		2		1		1				
" with endocarditis		1		1						
" " " and rheumatism		1		1						
Coccygodynia		1				1				
Dementia	1				1					
" senile		1				1				
Erythromelalgia	1				1					
Hemiplegia	2	1	1		1			1		
" and chronic endocarditis		1				1				
Hysteria	3	3	1	1	2	2				
" and hyperchlorhydria		1		1						
Insanity, emotional	1						1			
Lumbago	1	2	1	2						
Melancholia	1						1			
Menière's disease	1	1			1		1			
Meningitis, chronic	1				1					
" tubercular	1								1	
" gummatosa circumscripta regionis parietalis dextræ (Jacksonian epilepsy)	1				1					
Myalgia		1				1				
Myelitis, transverse		1				1				
Myotonia	1				1					

	Total		Cured.		Improved.		Unimproved.		Died.	
Nervous Diseases—*Continued.*	M	F	M	F	M	F	M	F	M	F
Intercostal neuralgia	1	..	1	..	..	..	..	..	..	..
Neurasthenia	11	9	11	8	..	1	..	..	..	..
" with hyperchlorhydria	..	1	..	1	..	..	..	..	..	..
Neuritis, brachial	1	..	..	..	1	..	..	..	..	..
" external cutaneous	1	..	1	..	..	..	..	..	..	..
" multiple	5	1	2	..	3	1	..	..	..	..
Neuromyelitis	1	..	1	..	..	..	..	..	..	..
Occipital neuralgia	1	..	1	..	..	..	..	..	..	..
Paralysis, post-diphtheritic	1	..	..	..	1	..	..	..	..	..
" recurrent laryngeal	1	..	..	..	1	..	..	..	..	..
" spastic (syphilitic)	1	..	..	..	1	..	..	..	..	..
Paramyoclonus multiplex	..	1	..	1	..	..	..	..	..	..
Sciatica	18	4	11	3	7	1	..	..	..	..
Sclerosis, amyotrophic lateral	1	..	..	..	..	..	1	..	..	..
" multiple	..	1	..	..	..	1	..	..	..	..
Syphilis, cerebrospinal	..	1	..	..	..	..	..	..	..	1
Tabes dorsalis	1	..	..	..	1	..	..	..	..	..
Tumor, cerebellar (specific)	1	..	1	..	..	..	..	..	..	..
" of brain	1	..	..	..	..	..	..	..	1	..
Total	61	37	32	21	24	13	3	2	2	1
Cutaneous Diseases.										
Eczema	1	..	..	..	1	..	..	..	..	..
Excoriationes e cimicibus	..	1	..	1	..	..	..	..	..	..
Syphilis, tertian, of the skin	1	..	..	..	1	..	..	..	..	..
Total	2	1	..	1	2	..	..	..	..	..
Surgical Diseases.										
Abscess, alveolar	1	..	1	..	..	..	..	..	..	..
" subphrenic	..	1	..	1	..	..	..	..	..	..
Fracture of hip	..	1	..	..	..	1	..	..	..	..
Lymphosarcoma of neck	1	..	..	..	1	..	..	..	..	..
" " intestines	1	..	..	..	..	..	..	..	1	..
Malignant growth of bone	..	1	..	..	..	..	..	..	..	1
Myositis, traumatic	1	..	1	..	..	..	..	..	..	..
Osteosarcoma of first rib	..	1	..	..	..	1	..	..	..	..
Periostitis, specific	1	..	1	..	..	..	..	..	..	..
Pes planus	..	2	..	1	..	1	..	..	..	..
Pott's disease, acute	1	..	..	..	1	..	..	..	..	..
Sarcoma of mediastinum	..	2	..	..	..	..	..	1	..	1
Synovitis of joints	1	..	..	..	1	..	..	..	..	..
Tumor, abdominal	1	2	..	..	1	1	..	..	..	1
Tuberculosis of glands of neck	..	1	..	..	..	1	..	..	..	..
" " knee joint	..	1	..	..	..	..	..	1	..	..
Ulcer of rectum	..	1	..	..	..	1	..	..	..	..
Ulceration of mouth (specific)	1	..	..	..	1	..	..	..	..	..
Total	9	14	3	2	5	6	0	2	1	4

Genitourinary Diseases.	Total.		Cured.		Improved		Unimproved		Died.	
	M	F	M	F	M	F	M	F	M	F
Cystitis	..	2	..	..	..	2	..	..	..	..
" acute	..	1	..	..	..	1	..	..	..	..
" chronic, and hemorrhoids	1	..	..	..	1	..	..	..	..	..
Hematuria	2	2	2	2	..	..	..	..	..	..
Nephritis, acute	2	2	1	..	1	1	..	..	..	1
" " exudative	1	1	..	..	..	..	1	1	..	..
" chronic	26	32	..	..	19	25	1	1	6	6
" " with endocarditis	5	5	..	..	2	2	..	..	3	3
" " " hemiplegia	..	1	..	..	..	1	..	..	..	..
" subacute	3	1	..	..	3	1	..	..	..	..
" with ulcus ventriculi	..	1	..	..	..	1	..	..	..	..
" " uremia	1	2	..	..	..	..	..	..	1	2
Nephrolithiasis	5	..	1	..	3	..	1	..	..	..
Phimosis, inflammatory	1	..	..	..	1	..	..	..	..	..
Prostatic hypertrophy	1	..	..	..	1	..	..	..	..	..
Salpingitis	..	2	..	..	..	2	..	..	..	..
Urethritis	1	..	..	..	1	..	..	..	..	..
Uterus, anteversion	..	1	..	..	..	1	..	..	..	..
Total	51	54	4	2	32	37	2	2	13	13
Miscellaneous Diseases.										
Goitre	4	9	..	..	3	7	..	2	1	..
Of these there were:										
Goitre, exophthalmic	4	7	..	..	3	5	..	2	1	..
Total	4	9	..	..	3	7	..	2	1	..

TWO CASES OF ACUTE YELLOW ATROPHY OF THE LIVER.

By Julius Rudisch, M.D.,
attending physician,
and
Israel Strauss, M.D.,
former house physician.

Gussie D., single, aged 20 years; born in Russia; dressmaker. Admitted November 27, 1900.

Family History.—Father committed suicide. Mother suffering from melancholia for the past nine years.

Previous History.—No history of typhoid, pneumonia, or rheumatism. About three years ago had an attack of pain in the right hypochondrium. Nothing further elicited as to the character of this attack. Patient was always nervous and of a morose disposition. Three weeks previous to her admission, had an hysterical attack of laughing and crying lasting for fifteen minutes. Brother averred that such spells were of not infrequent occurrence. Shortly after this she complained of pain in the right leg and lower lumbar region. She visited the Hospital for the Ruptured and Crippled, on Forty-second street in this city, where she was examined and assured that both leg and spine were normal. The surgeons, noticing that she was suffering from some acute illness, referred her to this hospital.

Present Illness.—This dates back one month, and commenced with pain in right side of abdomen, radiating down into right leg and also into the right shoulder. The pain was accompanied and followed by nausea, vomiting, and headache. During the past six days she has become jaundiced and has had slight chills followed by fever. Vomiting has continued. Bowels constipated; color of feces unobserved. Urine is dark in color. Menstruation had always been regular, both as regards time and amount, until this month, when it became profuse. No edema.

Physical Examination on admittance.—General condition was good. Body of medium frame and well nourished. General well-marked icterus. Sensorium dulled. Very drowsy.

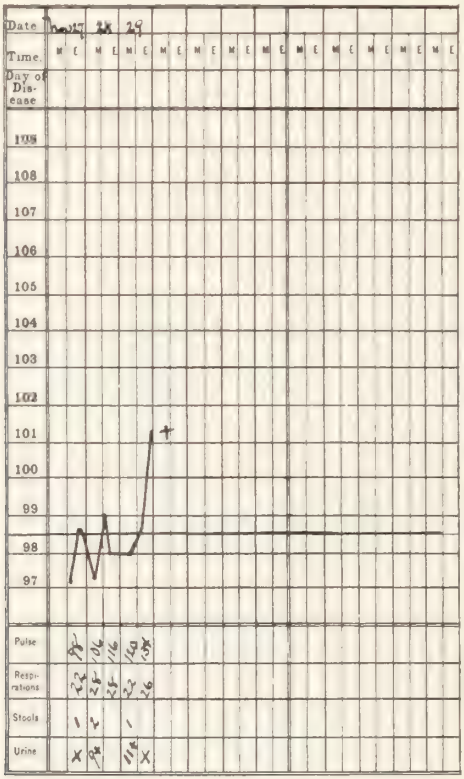
Lungs: Negative.

Heart: Borders normal. Sounds clear. No murmur. Action regular and somewhat accelerated.

Liver: Dulness commenced at fourth intercostal space; flatness at the sixth rib and reaching to free border.

Spleen: Upper border at ninth rib; reached to mid-axillary line. Free border not palpable.

Abdomen: Slightly distended. A tongue-shaped mass felt in the right hypochondrium below free border of ribs for about 4 cm., and lying between the parasternal and mammary lines—probably liver tissue. Below and beneath this is felt a resistant mass. Percussion



note dull and elicits tenderness. There is general abdominal tenderness. No glandular enlargements. No edema of extremities. Tenderness over lower ends of femurs. Leucocytes, 10,000. Temperature 97.2°-98°, pulse 98-120, respiration 20-28. Urine: acid; 1024; albumin present; no sugar; bile present; trace of indican; urea 1.5 per cent.; microscopical examination—a few hyaline and granular casts, few pus and epithelial cells.

November 29, 10 A.M.: Patient lies in stupor. Sensation present. Icterus has increased. There are no petechiæ. Lungs are negative.

Heart action rapid and forcible. Liver flatness begins in fifth space, and the free border is palpable one finger's breadth below the ribs. Spleen is not palpable, and splenic dulness is obscured by tympanitic note. The abdomen has become more distended and tenderness has disappeared. The mass cannot be felt below the liver. Knee jerks active, and ankle clonus present in both extremities. Leucocytes, 7,500. Temperature 98°-97.8°, pulse 118-120, respiration 20-22. Urine: acid; 1038; albumin present; no sugar; urea 1.8 per cent.; bile increased in quantity; microscopical examination—hyaline and granular casts; few pus and epithelial cells; no leucin or tyrosin.

1:30 P.M.: Becoming more restless; moaning; got out of bed; had to be restrained.

4:30 P.M.: Patient's body in position of moderate opisthotonos, with right side of body arched more than the left. Arms continually moved back and forth across body. Fingers of left hand clenched. Feet held in extreme plantar flexion. Knee jerks present. Left pupil dilated more than right; both react to light. Stupor and muttering delirium. Responded slightly when straw was inserted in nostrils. Dr. Janeway saw patient at this time and remarked upon the close resemblance of the clinical picture to that presented sometimes in the state known as hystero-epilepsy.

8:30 P.M.: Patient quieter; deep stupor; breathing and pulse irregular. Liver percusses slightly smaller. Temperature 101.2°, pulse 144, respiration 26.

November 30: In coma. Exitus at 3 A.M. Urine: acid; specific gravity 1032; trace of albumin; sugar absent; urea 2 per cent.; bile, large quantity; hyaline and granular casts; epithelial cells, no leucin or tyrosin; no phosphorescence obtained through distillation.

Clinical diagnosis: Acute yellow atrophy of the liver (Dr. Rudisch).

ABSTRACT OF PROTOCOL OF AUTOPSY MADE SEVEN HOURS POST MORTEM (DR. E. LIBMAN, ASSISTANT PATHOLOGIST).

Marked rigor mortis; all organs bile-stained. Diaphragm: right side, third space; left side, fourth space. Liver extends to seventh interspace in mammillary line; in median line, 3 cm. below ensiform cartilage. Small amount of bile-stained, clear fluid in abdominal cavity.

Spleen.—14 by 7.5 cm.; fine deposits of fibrin on surface. On section, pulp fairly easily scraped off; connective tissue somewhat prominent; weight, 185 grammes.

Kidneys.—Left: capsule not adherent; superficial veins congested; section firm; medulla congested; cortex, marked fatty degeneration; weight, 180 grammes. Right: same as left; weight, 180 grammes.

Adrenals.—Negative.

Lungs.—Congested; edematous; full of large hemorrhagic areas; bronchial nodes not enlarged.

Heart: Edge of tricuspid and of mitral flaps slightly thickened; muscle is fatty, cloudy in spots.

Liver.—23 by 19 by 8 cm. Weight, 1,300 grammes (43 ounces). Liver very fatty; consistence soft; depressions between lobules. Large number of areas absolutely yellow; many elevated from surface on cut section, varying in size and shape, the smallest pinpoint in size, largest 3 cm. in diameter. Some of the areas collected near each other so as to involve comparatively large areas of tissue. Areas lie mainly about branches of portal veins, but veins themselves show no macroscopic changes. After specimen was kept in formalin for a few hours, the yellow areas were found to be markedly bile-stained and to be surrounded by hemorrhagic zones varying in size from that of a pinhead to one-third of an inch in diameter.

Gall Bladder, Vessels, and Ducts.—Negative.

Stomach. Moderately distended by fluid blood contents and coffee-ground material. Mucous membrane swollen. Near pylorus are a large number of hemorrhagic areas. Mucosa shows marked depressions between groups of tubules.

Intestine. From duodenum and for a stretch of small gut six feet in length, contents markedly bloody; then for two feet contents fairly normal and yellow; then for four feet intestine contains fairly firm, slimy, greenish-gray contents; then contents are bloody down to cecum. In the colon is fluid grayish stool having a metallic lustre. Intestinal wall shows moderate congestion. In places throughout small intestine are numbers of small hemorrhages in mucous membrane. Colon much dilated, not congested or inflamed. Slight enlargement of lymphoid nodules in colon.

Mesentery.—Mesenteric nodes slightly enlarged; pink color; large hemorrhagic extravasation in left part of mesentery, and another of moderate extent in postperitoneal connective tissue.

Pancreas.—Negative.

Adnexa.—Corpus luteum in left ovary.

Bacteriological Examination.—A blood culture made before death, and in which 10 c.c. of blood were used, proved negative when grown both aerobically and anaerobically. Postmortem cultures taken from all the organs showed both streptococci and bacilli coli communis.

MICROSCOPICAL EXAMINATION (DR. F. S. MANDLEBAUM, PATHOLOGIST).

Liver.—It is with difficulty that the lobules can be recognized, on account of the marked changes that have occurred throughout the sections. Here and there a few liver cells are seen which have escaped the degenerative processes, and these seem to mark the periphery of the lobules. The nuclei of these cells also appear quite normal. A marked fatty degeneration is seen everywhere, and in some places even the nuclei can no longer be distinguished. In other situations the degeneration is so marked that a true necrosis of all the structures is apparent, presenting a granular appearance with barely any stain-

ing power. The nuclei are also missing in these situations. A moderate amount of acute inflammation about the branches of the hepatic artery is noted, and the walls of this vessel appear slightly thickened. The intralobular veins, as well as the portal vein, show a moderate dilatation. The bile ducts show only a moderate tendency to proliferation. The capillaries are dilated, and in places slight hemorrhage has occurred. A moderate amount of blood pigment is seen.

Diagnosis: Fatty degeneration; acute degeneration with necrosis; congestion and hemorrhage (acute yellow atrophy).

Malie L., married, aged 21 years. Admitted September 25, 1902.

Family History.—Negative.

Previous History.—Ordinary diseases of childhood. Normal menstruation. Married five months. Pregnant about four and a half months. Four and a half years ago had acute otitis media in left ear. In May, 1899, was treated in this hospital for typhoid fever (Widal positive).

Present History.—Two weeks ago began to have severe continuous headache (not localized); later epigastric pain followed by vomiting of all ingesta (five or six times daily) for several days, but vomiting gradually abated. To-day vomited blood (swallowed during an epistaxis). Has had chilly sensations since onset of illness. Bowels have moved in response to cathartics and enemata; urination apparently normal. No vaginal hemorrhage. Profuse leucorrheal discharge. No cough or expectoration. No jaundice, no edema. Has complained constantly of headache. Cries out and acts hysterically.

Physical Examination.—General condition fair; well nourished; appearance septic; exalted mental state, at times real delirium alternating with sleepiness; no enlargement of glands; tongue dry and coated; throat dry; no petechiæ; no jaundice.

Lungs: At right base posteriorly, dulness from angle of scapula and base; breathing and voice normal; line of dulness descends with respiration.

Heart: Borders normal; action, over-active; rapid; at pulmonic area, transmitted almost to the apex, is a loud systolic murmur; basic sounds loud. Pulse full but soft.

Liver: Dulness from fourth intercostal space to just above free border, fifth intercostal space in axilla. Free border not palpable. Posteriorly dulness reaches nearly to angle of scapula.

Spleen: Percussion note obscure by tympany; not palpable.

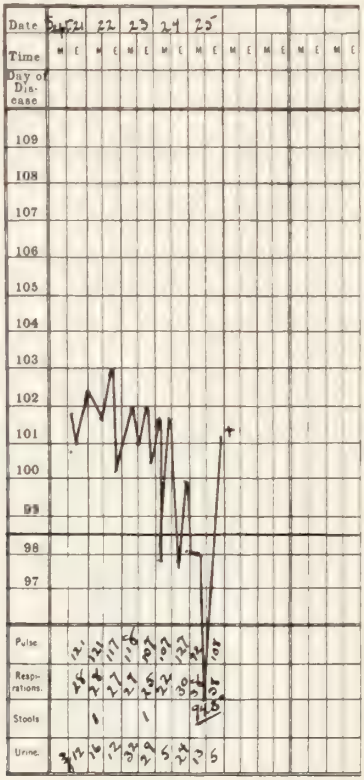
Abdomen.—Tympanitic; slightly distended; right side somewhat rigid. From about one and one-half fingers below umbilicus to pubes, chiefly on right side, well to outer border of rectus, is a rounded, hard mass (pregnant uterus), not sensitive.

Vaginal.—Cervix soft, almost as soft as vagina; by bimanual palpation the uterus is felt to be enlarged.

Extremities.—Negative. Had severe epistaxis; necessary to cathe-

terize. Leucocytes, 11,000. Temperature 101.8° F., pulse 132, respiration 32.

September 22: Mental condition somewhat improved. Temperature 102° in A.M., 103° at noon, and 100.2° at midnight; pulse 116 and 124, respiration 24 and 30. Urine: acid; 1018; faint trace of albumin and sugar; urea 1.1 per cent.; total quantity of urine in twenty-four hours, 28 ounces; microscopical examination negative. Had another



epistaxis. Complained of severe headache; catheterized; sedatives given.

September 24: Distinct ptosis of left eye; pupils large, equal, do not react to light. Facial weakness on left side, increasing rapidly during day. Increasing stupor. Hyperesthesia and subconjunctival icterus. Dr. Brettauer says uterus is normal. Delirious most of the night; attempted to get out of bed. Catheterized. 9:30 P.M.: Pupils unequal, left larger. Breathing irregular, at times stertorous, and later Cheyne-Stokes'. Convulsive twitchings on both sides, more especially on left. *Eye*—Fundus of left eye shows papillitis; right eye

normal. *Ears*—Left shows retracted drum with dimple below malleolus. *Knee Jerks*—Exaggerated on right side, on which side there is a decreased reaction to stimuli; on left side the opposite obtains. Slight *tache cérébrale* present. Temperature 101.8° A.M., fell to 98.2° at midnight; pulse 122 in morning and 90 at night; respiration 26 to 40. Urine: alkaline; 1018; no albumin; no sugar; urea 1.4 per cent. in total quantity of 6 ounces; microscopically, phosphate crystals and a few epithelial cells.

September 25: Deep coma; both pupils widely dilated. Breathing slow and stertorous; slight twitchings and automatic movements of both arms during the day. Temperature subnormal, 94.8°. Icterus increased. *Liver*—Fifth rib to above free border, posteriorly one and one-half fingers' breadth below angle of scapula. Leucin and tyrosin found in urine.

Dr. May finds a marked papillitis in left side, with hemorrhage near disc; right eye practically normal. Patient continued stuporous. At 6 P.M. a general convulsion with foaming at mouth. Ceased to breathe 7:35 P.M. Temperature post mortem 101.2°.

Clinical diagnosis: Acute yellow atrophy of the liver.

ABSTRACT OF PROTOCOL OF AUTOPSY MADE THREE HOURS POST MORTEM (DR. E. LIBMAN, ASSISTANT PATHOLOGIST).

No rigor mortis; no edema; body poorly nourished; slight icterus of skin and conjunctivæ; no petechiæ, no ascites (organ bile-stained).

Thymus.—Not evident.

Lungs.—Moderately firm adhesions over right lung. Both lungs show emphysema of upper lobes; both are congested and edematous; numerous hemorrhagic areas; no consolidation. Left bronchial nodes enlarged and pigmented. Right bronchial nodes calcareous.

Heart.—Flabby and muscle cloudy; right auricle markedly, and both ventricles moderately, dilated; valves normal; no atheroma of aorta or of coronaries; no congenital lesions.

Liver.—Weight 1 kilogramme 575 grammes (3 pounds 2½ ounces); lower border just within free border of ribs in mammillary line; in median line, extends one-third of the distance from ensiform to umbilicus. Liver somewhat soft. As a whole it appears very fatty. Scattered throughout it are a number of slightly elevated areas, ochre-yellow in color, surrounded by a dark-red rim. The yellow areas vary in size from pinhead to one-half centimetre in long diameter. In places they seem to be mainly grouped about the central veins, in others about the branches of the portal vein. On the whole the distribution is irregular, but the entire liver is involved. Portal vessels distended by fluid blood.

Gall Bladder.—The gall bladder and ducts show no changes. The gall bladder is moderately filled with dark-colored bile.

Portal Veins.—Not thrombosed.

Large Abdominal Vessels.—Negative.

Spleen.—Slightly enlarged; weight, 200 grammes; surface very dark; on section, marked congestion; bodies very large; pulp easily scraped off; splenic vessels normal.

Stomach.—Moderately distended; contains brownish fluid; mucosa swollen, studded with hemorrhages.

Intestines.—Mucosa here and there shows some swelling with marked injection of vessels; small intestine contains partly fluid material, partly from fecal masses, the entire contents being olive-green in color. The large intestine contains firm yellowish stool. Mesenteric nodes slightly enlarged.

Pancreas.—Soft, yellowish. No gross pathological change.

Kidneys.—Right weighs 250 grammes, left 190 grammes. Both quite firm; marked congestion on surface. On section, appear congested, cloudy. Cortex yellowish in color; capsules not adherent. Both pelves dilated. Ureters size of small finger, both being obstructed by pressure of the uterus; they contain clear fluid.

Uterus and Adnexa.—Uterus reaches to umbilicus. Contains a male fetus 23 cm. in length, apparently normal, but yellowish in color. Genital apparatus well formed; nails present; placenta on anterior wall of uterus. Uterus, vessels, etc., show usual changes of pregnancy.

Brain.—Slightly edematous; veins on surface implicated. Thin exudate over base, involving cerebellum; exudate whitish, in some places rather yellowish. Fluid between arachnoid and dura increased. Fluid in ventricles increased, clear. Choroid plexuses congested; show small cysts. No focal lesions in brain. *Dura.*—Negative. Sinuses negative; tegmen tympani on both sides negative.

Bacteriological Examination. Spleen: In sugar bouillon, streptococci Gram-positive; and a Gram-negative, short bacillus with rounded ends. Spreads made from exudate at base of brain showed no bacteria.

MICROSCOPICAL EXAMINATION (DR. F. S. MANDLEBAUM, PATHOLOGIST).

Sections from the liver show the lobules to be fairly well marked. The periphery of each lobule is well defined, and the liver cells at this situation are the least changed of all, showing only a slight granular degeneration of the protoplasm. The nuclei are somewhat swollen. The cells take up the stain fairly well, and the nuclei appear practically normal with the exception of a slight variation in size. Toward the centre of each lobule the cells become more and more changed. The border of each individual cell is still well seen, but the protoplasm has been entirely changed by a marked degeneration, mostly albuminous in character. Here and there some fatty degeneration is also noted. The cells have lost their power of staining to a marked extent. At the periphery of some of the lobules a collection of lymphoid cells is seen, also a few leucocytes. The capillaries are much dilated and filled with blood. In some places an actual hemorrhage

into the liver parenchyma has taken place, and a small amount of blood pigment is also seen. The intralobular veins appear somewhat dilated. The branches of the portal vein and hepatic artery show no changes. The bile ducts are normal and show no tendency to proliferation. No true necrosis of the liver can be demonstrated.

Diagnosis: Acute congestion; acute albuminoid degeneration; moderate fatty degeneration.

The clinical interest in these two cases of acute yellow atrophy of the liver centres in the nervous symptoms which they presented. In fact, it was the resemblance between this symptom of the second case and the nervous disturbances of the first, together with the presence of jaundice, which led me to suspect that we had to deal with another case of atrophy. The cerebral symptoms were such as we are accustomed to regard as caused by severe toxemia. There was severe headache; moaning; constant restlessness; convulsive movements; drowsiness, deepening into stupor and finally coma. In the first case this picture was complicated by the addition of elements which had much of a hysterical nature about them. The patient held her body for some time in a position closely resembling the *arc de cercle* of hysteria major, and could most easily be roused from her stupor by tickling the nasal mucous membrane with a straw. Leube calls attention to the fact that cases of hysteria accompanied by jaundice, when they occur in women, sometimes manifest such severe cerebral symptoms, as delirium and convulsions, that they are apt to be mistaken for acute yellow atrophy. Besides the general symptoms in the second case, there were evidences of focal cerebral disturbances in the form of ptosis and facial paresis, as well as optic neuritis. These constituted a very unusual feature of the case and were probably due to the exudate found at the base of the brain.

The liver was found to be enlarged *intra vitam* in both cases, but there was subsequent diminution in size only in the first. This diminution did not reach the extreme degree reported as especially characteristic of most cases of acute yellow atrophy, and the weight of the organ post mortem in either case was not much below the normal.

Neither case could be said to have run a febrile course; the first remained afebrile until just before death, while the second was admitted to the hospital with a temperature of 101.8°, which rose on the following day to 103°, and then fell steadily, until five hours ante mortem it had fallen to 94.8°. The high postmortem temperature observed in cases of acute atrophy was not noted.

In the urine also we find differences in the two cases. In the first, at no time was leucin or tyrosin present, nor was any found in the liver after death. Both were present in the urine of the second case. The absence of these two substances in the urine in cases of acute yellow atrophy is not unknown, and their presence is likewise not pathognomonic. Both substances have been recently found in cases of sepsis in the surgical division of the hospital. The quantity of urine passed could not be accurately ascertained because of involuntary micturition, but it appeared to be much below the normal.

The percentage of urea, however, remained 2 per cent. or under, thus showing a diminution in the total quantity excreted. This is in line with the facts generally observed. On the other hand, the quantity of urine obtained from the second case varied anywhere from 28 to 60 ounces in twenty-four hours, and the urea remained slightly under 1.4 per cent.—not so marked a lessening in the quantity.

Hemorrhage occurred only in the first case. It was from the stomach and intestines.

The etiological factor in either case remains unknown. There was no history of taking phosphorus or other poison, nor any attempt at abortion, in the second case. In the first case there were no evidences of pregnancy. However, her marked psychopathic family history and the evidences she herself gave of psychical abnormality would not make an assumption of suicide at all improbable. The urine and livers of both cases were examined for traces of phosphorus, but with negative results.

Pathologically, we have two distinct pictures presented to us. In the liver of the first case there is the typical microscopical picture of fatty degeneration in the liver cells, more especially about the intralobular veins. There is also commencing proliferation of the bile ducts. The occurrence in places of hemorrhagic areas may be regarded possibly as precursory to the stage of red atrophy. In the second case, while there is some fatty degeneration in the liver cells, the striking and most prominent lesion is that the cells occupying the zone midway between the centre and periphery of the lobule are in a state of coagulation necrosis. This is the area of the liver lobule where the anastomosis between the capillaries of the portal vein and those from the central vein takes place, and it would appear, judging from the nature of the necrosis, that the toxin or other injurious substance coming from the portal system caused a sudden death of those cells with which it first came in contact. This may account for the lesser

amount of fatty degeneration in this liver as compared with that of the first case; and this same rapidity of toxic activity may also explain the absence of proliferation of the bile ducts. From the pathological conditions in this second case some might be inclined to consider it a case of acute degeneration of the liver as distinct from acute yellow atrophy. We do not believe that our present knowledge justifies our founding such a distinction on a pathological basis. In cases of severe sepsis arising from various causes, such as appendicitis, osteomyelitis, and infectious diseases, the liver is often the seat of degenerative changes which are general or circumscribed and range in degree from cloudy swelling (acute parenchymatous degeneration) to fatty degeneration and actual necrosis. The degree of pathological change depends upon the virulence of the toxic agent. We consider that the same gradations in degeneration in the liver most probably occur likewise in acute yellow atrophy, and that the degree of severity reached by the process depends upon the strength of the toxic agent. Acute yellow atrophy is a complex of symptoms, a clinical entity, caused by some unknown toxin, and accompanied by degenerative changes in the liver. The second case corresponds clinically in all essentials to this symptom complex, just as well as does the first case. There is in addition necrosis of the liver substance, which we think was caused by some intoxication; and hence the case must be included within the category of cases of acute yellow atrophy of the liver, even though pathologically the predominant lesion is one of coagulation necrosis rather than of fatty degeneration.

PRIMARY SARCOMA OF THE LUNG AND PLEURA.

By Julius Rudisch, M.D.,
ATTENDING PHYSICIAN.
AND
Herman Schwarz, M.D.,
FORMER HOUSE PHYSICIAN.

Primary carcinoma and sarcoma of the lung and pleura are relatively so uncommon that the two cases to be described are well worthy of report. Reinhard found 5 primary carcinomata in 545 cases of tumor of the lung. Passeler found 16 in 870 and 4 sarcomata in 130 cases. It occurs most frequently between the ages of 40 and 60 (Reinhard, Passeler, and Wolf), 20 to 40 (Osler, Hassa). Yet primary sarcoma has been described as occurring in very young children, these originating in the thymus (Virchow). It is more common in men than in women (76 to 24), this probably being due to the greater liability to trauma, which plays an important rôle in its etiology. Aufrecht cites four cases, in which two had a distinct history of injury. In our cases no such etiological factor could be made out.

The primary sarcomata usually affect but one lung; they may be of the spindle cell, the large or small round celled variety, or of the type known as the lymphosarcoma. The spindle or round celled sarcomata usually present one mass, taking in the whole of one lobe or the entire lung, and actually replacing it, for on section no remains of lung tissue can be made out. They tend to degenerate and break down, forming soft cystic or purulent masses, this being in part an explanation of the recurrent fever so often present in tumor of the lung. The lymphosarcomata usually form several tumors, starting at the root of the lung and travelling along the bronchi. They are of firm hard or softer elastic consistence, and on section present portions of lung tissue or bronchi surrounded by tumor mass. They rarely break down.

Mrs. L. M., aged 53, admitted October 12, 1901; occupation, housewife; German birth.

Family History.—Negative.

Previous History.—Rheumatism right hip 15 years ago. Pneumonia four years ago (history of lung involved cannot be obtained). Pleurisy with pain in both chests two years. Still has irregular menstrual periods.

Present History.—Began two months ago with dyspnea and slight edema of the face and neck. No headache, no fever, no cough and expectoration. Physician was called in and diagnosticated fatty heart, for which she was given digitalis. This caused considerable irritability of the stomach. For the past five days breasts have been swollen. No swelling of the feet. No urinary symptoms.

Status Presens.—A short, stout, well-nourished woman; panniculus adiposus marked. Edematous infiltration of the forehead, cheeks, neck (especially left side), and both breasts. Infiltration of tissues of the thorax as low down as two fingers above the umbilicus. No edema of uvula, tongue, tonsils, or of lower extremities. Glands of neck cannot be made out on account of infiltration of tissues. No glands in axillæ or groins. Marked dilatation of veins about the shoulders and chest.

Lungs.—Dull, almost flat note at right apex; poor note over left apex; dull over upper half of sternum; good note in axillæ. Breathing tubular at right apex, less markedly so over anterior of right chest and in right axilla; high-pitched over left chest. Voice bronchial over right chest. Fremitus cannot be made out over both chests. Posteriorly, dull note at right apex, becoming flat at base; flat at left apex, resonance becoming pulmonary in the midscapular region. Breathing markedly tubular over right apex to angle of scapula; at left apex it is high-pitched and almost bronchial. Few crepitations scattered over both lungs. Voice at right apex bronchial; bronchial at left apex, becoming normal at spine of scapula.

Heart.—Normal as far as can be determined; sounds faint; no murmurs.

Abdomen.—Cannot be properly examined on account of amount of fat and the dyspnoic attacks which occur when put in prone position.

Urine.—Negative.

Temperature 99°. Radial pulses equal.

October 30: Patient has attacks of dyspnea which make her blue, pupils dilated, pulse rapid and feeble. There is no cough or expectoration. No temperature. Speech is slightly hoarse. Larynx examined by Dr. Gruening: a left recurrent laryngeal paralysis present.

November 15: Dyspnoic attacks very frequent. Pulse very feeble. General condition rapidly becoming worse. Some difficulty in swallowing. Edema of right arm. Right radial smaller than left. No temperature or cough. Urine negative.

December 1: Dyspnea marked. Pulse feeble. Edema of face, neck, etc., much increased.

December 12: Ceased breathing.

Clinical diagnosis: Tumor of mediastinum and lung.

PROTOCOL OF POSTMORTEM MADE FOUR HOURS AFTER DEATH BY DR. LIBMAN.

Head not opened. No rigor. Puffiness of face. Slight bilateral exophthalmos. No edema of legs. Considerable edema of chest wall.

Thyroid. Very much enlarged, entirely replaced by fairly firm growth, white in color. Trachea compressed.

Thorax.—Entire mediastinum occupied by enormous growth. This is white in color, uniform in appearance, and very firm; it extends into right and left sides of thorax, compressing both lungs. The growth has eroded the posterior surface of the sternum and has grown out through the second, third, and fourth right intercostal spaces into the subcutaneous tissues. The tumor extends above the jugulum about 1 cm. and infiltrates the muscles of the neck. Some of the mediastinal nodes are still distinct, being very large and diffusely infiltrated.

Right Lung. Moderate amount of bloody fluid in pleural sac. Lung is considerably compressed, and the upper lobe is infiltrated by the growth. Lung is pale as a whole, but the base is congested. Bronchial nodes moderately enlarged, congested, and anthracotic.

Left Lung. Congested and edematous; emphysematous at apex. Bronchial nodes as on right side.

Larynx and Trachea. Compressed from before backward. Esophagus surrounded by large infiltrated nodes. Trachea and left bronchus infiltrated by growth which extends to the mucosa.

Heart.—Displaced downward and to the left. Right ventricle and auricle moderately dilated. Mitral valve thickened. Aortic valves and aorta negative.

Superior Vena Cava.—Almost closed off by growth which extends to intima.

Spleen. Moderately enlarged, very flabby; pulp soft, congested; connective tissue increased.

Liver.—Moderately enlarged, congested, and fatty. In left lobe, under surface, there is a metastasis, white in color, one-half cm. in diameter.

Kidneys.—Capsule adherent; surface irregular; cut section firm; markings good; one small metastasis on surface of left kidney.

Adrenals.—One nodule in each, rather soft, about 1 cm. in diameter.

Pancreas.—Soft.

Intestines.—Negative.

Microscopical Examination by Dr. Mandlebaum.—Thyroid: Angiosarcoma. *Tumor:* Angiosarcoma. *Adrenal:* Angiosarcoma (metastatic). *Kidney:* Chronic nephritis, acute congestive. *Liver:* Metastasis. *Spleen:* Chronic interstitial splenitis, acute congestion.

I. M., aged 33 years, admitted to hospital January 4, 1901.

Family History.—Negative.

Previous History.—Syphilis thirteen years ago; a short inunction cure. Nine years ago specific skin eruption occurred. Eight years ago, swelling of left testicle, which disappeared under specific treat-

ment. Five years ago, testicle again swollen, but treatment of no avail; was removed at the German Hospital, January, 1897. Pathological diagnosis was syphilis. Soon after this began to have feeling of weight and oppression in epigastrium, most marked after eating. This is still present. Did not vomit until two months ago, and since then has vomited once or twice every day. No alcohol or tobacco habits.

Present History.—Eight months ago began to have severe pain in left chest, which prevented him from taking a deep breath. This pain became less severe after a few days. About three months ago pain again present, and took iodides, which seemed to relieve it somewhat. No cough except when eating. For the past four weeks noticed that voice was hoarse when he got up in the morning. For the past two weeks he has been hoarse all the time. Has lost considerable weight. Bowels regular. No urinary symptoms.

Status Presens.—Complexion sallow. General condition fair; fairly well nourished. Throat negative. All the lymphatic glands slightly enlarged. Bulging of left chest. Considerable tenderness over left side of thorax. Veins of upper extremity and chest prominent.

Lungs.—Anteriorly: Right side hyperresonant, left flat. No respiratory murmur over left chest. Voice and fremitus absent. On right side signs of compensatory emphysema. Posteriorly: Note over right chest good, flat over entire left chest. Voice and fremitus absent on left side. Few friction râles over both lungs posteriorly.

Heart.—Borders cannot be made out. Sounds faint. No murmurs. Left radial artery barely perceptible, right distinctly felt.

Liver.—Palpable two fingers below free border.

Spleen.—Not palpable.

Abdomen.—In right lumbar region pear-shaped mass felt, moving with respiration.

Scrotum.—Small; only one testicle.

Lower Extremities.—No edema. No bony tenderness.

Blood spread negative. White blood cells, 22,400; red blood cells, 4,460,000.

January 10: Left chest aspirated—negative.

January 13: Emaciation more marked. Blowing systolic heard in third and fourth left interspaces.

January 15: Faint respiratory murmur heard at spine of left scapula.

January 26: Small portion of subcutaneous tissue removed from left infrascapular region. Section showed nothing pathological (Dr. Mandlebaum). No tubercle bacilli in sputum.

February 7: Diastolic murmur heard over second right interspace. Tubular breathing at left apex; absent breathing below this. Glands in the neck are larger. Spleen palpable two fingers below free border. Patient looks anemic. Left upper extremity and face slightly edematous. Left chest measures 46 cm., right chest 41 cm.

February 12: Complains of severe pain in left chest, slight pain in

right chest. Considerable dyspnea. Edema of face and left extremity increasing. Some edema of left chest wall present; abdomen and lower extremity not involved.

February 15: Emaciation increasing. Edema of left forearm and hand marked. Veins of trunk markedly distended.

February 17: Frequent attacks of dyspnea. Edema of lung present. Ceased breathing.

Throughout his entire stay in the hospital patient ran a temperature varying from 99 -100° in the morning to 102 -103° in the evening, often going up to 104°.

Urine normal until a few days before death, when a slight amount of albumin and a few casts were present.

Clinical diagnosis: Tumor of lung.

PROTOCOL OF AUTOPSY MADE NINE HOURS POST MORTEM BY DR. MANDELBAUM.

Isaac Mendel, 33 years old, admitted January 4, died February 17. Head not opened. Moderate rigor. Body slightly emaciated. Left half of thorax distinctly larger than right. Edema of left side of thorax, left arm and hand. On removing sternum it is noted that growth protrudes between the second and third costal cartilages on the left side. Sternum is adherent to mass and fills the entire mediastinal space. Heart occupies a position in the right thoracic cavity corresponding to its usual position in the left side.

Lungs.—Right: Rather voluminous. In upper lobe at apex an old whitish cicatrix, slightly depressed. Beneath this are a few calcareous nodules, healed tuberculosis. Moderate amount of edema, no consolidation. Bronchial lymph nodes pigmented, but not especially enlarged. Larger bronchi show moderate amount of congestion. *Left:* The entire left side of the thorax and mediastinum is entirely filled by a tumor mass. It is firmly adherent to the inner wall of the thorax and vertebral column, so that a dissection is necessary to remove same. The tumor is also firmly adherent to the pericardium. In removing tumor, lungs, and heart *in toto*, a large abscess cavity is ruptured and about a quart of foul-smelling pus is evacuated. Section through mass shows remains of lung tissue remaining in the upper lobe, but this is so infiltrated that lung tissue is barely perceptible. That portion of the mass represented by the lower lobe is entirely composed of new growth. The tumor is grayish white in color, very soft in consistence. Scattered throughout are areas of necrosis. In these situations the tumor is of a fluid, milky consistence.

Axillary Nodes.—In left axilla are some enlarged nodes consisting of tumor mass with fluid contents of a pure white color resembling condensed milk.

Heart.—Upon opening the pericardium it is seen that this is firmly adherent to the heart. The tumor mass is also found to have extended completely through the pericardium on the left side, forming small,

rough nodules upon the inner surface. Heart appears somewhat small, and is not opened for examination. All the large vessels are entirely surrounded by tumor and are almost hidden.

Spleen.—Somewhat enlarged; pulp soft, easily scraped from surface; color dark chocolate.

Kidneys.—Size normal. Capsules slightly adherent in places. Surface slightly rough. On section, markings are plain. Some congestion and a slight granular appearance of cortex are noted.

Liver.—Size normal. Slight congestion. Veins negative.

Stomach.—Vessels in mucosa somewhat engorged and prominent.

Pancreas.—Negative. Just below and behind pancreas is a mass, about the size of a lemon, lying directly upon the vertebra. This is similar to the growth in the thorax and appears to be a direct extension downward through the diaphragm and encircling the aorta. The consistence is almost fluid. No other growths are found.

Intestines and Bladder.—Negative.

Microscopical Examination.—Lung: Endothelioma, purulent inflammation. *Axillary Node:* Endothelioma, purulent inflammation. *Liver:* Congestion, pigmentation, acute inflammation. *Spleen:* Pigmentation, chronic inflammation. *Kidney:* Congestion, chronic nephritis, acute degeneration.

In considering the symptoms and diagnosis of tumors of the lung and pleura, it is almost impossible to distinguish between the carcinomata and sarcomata; yet, as we shall see later, one may venture at a probable diagnosis of the variety of tumor.

Before going into a discussion of the symptoms, subjective and objective, which may be present, it is important to know that there are cases in which there are absolutely no symptoms referable to the lungs or pleura as the seat of the disease (Ebstein, Osler, Walshe). The subjective symptoms which may be present are dyspnea, stridor, cough and expectoration, and pain in the chest.

Dyspnea is very often the earliest and probably the most constant symptom, as shown in Case I. It is a gradually progressive dyspnea, greatly increased on lying down, more so than on exertion. Yet, in contradistinction to this, Ewald cites a case where the tumor was situated between the trachea and esophagus, in which the dyspnea was greatly relieved when the patient was put in the prone position. The dyspnea may, however, be almost absent, as in our second case, appearing only a short time before death. It often occurs in paroxysms, during which the patient becomes deeply cyanotic, almost unconscious, pupils dilated, pulse rapid and feeble. The stridor and dyspnea are much more marked in the sarcomata as compared with

the carcinomata, and Schwalbe makes this a differential diagnostic point between the two growths.

Cough and expectoration are very often absent, as seen in both of our cases. The *cough* depends to a certain extent upon the location of the tumor; those involving the pleura present this symptom more constantly. Yet it is absent so frequently that it has absolutely no diagnostic worth.

The *sputum* was at one time considered of great importance. The so called cranberry or prune-juice sputum was considered typical and Stokes laid great stress upon it. It was present in 10 out of 18 of his cases. Ebstein places no value upon it whatsoever, for it was absent in all of his reported cases. Blood is often present in the sputum, Stokes finding it in one-half of 49 cases. Blood-tinged mucus was thought characteristic by Woillez. Grass-green sputum has also been seen, but this has been found in pneumonia going on to abscess formation, the sputum remaining in the bronchi, becoming mixed with blood and changing to this color. Particles of the tumor found in the sputum are diagnostic, but, as Ebstein pointed out, these are but rarely found and it requires an expert to make the pathological diagnosis. Hampeln considered groups of cylindrical cells of importance; but Traube showed that it was very uncertain to make a diagnosis from these cells, for at times similar cells appeared in sputum from tubercular cavities.

This brings us to mention the pathological observation that tuberculosis of the lungs and malignant growth are not infrequently found in the same subject; thus the presence of tubercle bacilli in the sputum does not exclude malignant growth.

Carcinomatous nodules have been found extending into tubercular cavities. Wolf reports 31 cases of carcinoma, 13 of which showed the combined lesions. Schwalbe reports 3 cases. Hildebrand and Friedlander report others.

Pain is a very variable symptom and is naturally more constant where the pleura is involved. Fever is a symptom more often present in sarcomata than in carcinomata. It is often of a remittent or intermittent type (*chronischer Rückfallfieber* of Ebstein), as seen in our second case. Yet it may be entirely absent, as in our first case. It is usually due to ulceration or purulent infiltration of the tumor, but may be present without any demonstrable cause. Cachexia and rapid loss of weight occur late in the disease.

The physical signs which are found in tumors of the lung and pleura

are very variable and not at all diagnostic. Local edema is of considerable importance. It usually extends over the neck, thorax, and arm of the same side on which the lung is affected. Senator says that this is a good differential point from pleurisy with effusion, for there is rarely edema of the chest wall and arm in this affection. Dilatation of the superficial veins of the thorax and arm, especially on the side affected, is also valuable.

Involvement of the glands of the neck and axilla may help by enabling one to excise a gland, cutting same, and thus obtain an accurate diagnosis. Yet the infiltration and edema may be so marked as to prevent us from feeling the glands, as in Case I.

One radial pulse may be smaller than the other, thus aiding in the diagnosis of intrathoracic growth.

In every case a laryngoscopic examination should be made, even when there is no change in voice or aphonia. A paralysis of the right cord speaks more for tumor and against aneurism, involvement of both cords for tumor. In such a case one cord is in the median, the other in the cadaveric position; thus fatal dyspnea is not likely to occur. By tracheoscopy one sees the trachea pushed to one side in aneurism, whereas in tumor it is compressed from before backward.

As far as the physical signs which are produced by the lesion in the lung and pleura are concerned, there is absolutely nothing pathognomonic. When one considers that the entire affair may be masked by an immense pleural effusion, that areas of pneumonia may surround the growth, or atelectases caused by the growth (v. Körner), one can easily see what different groups of auscultatory and percussory signs may be made out.

Pleurisy with effusion is more common in the sarcomata than in the carcinomata. These pleurisies are not usually hemorrhagic, as is commonly believed, for in 200 cases described by Moulard and Martin only 12 per cent. showed bloody fluid. Aufrecht says that hemorrhagic fluid is more common in non-malignant than in malignant pleurisies. A. Frankel has drawn attention to cells which, when repeatedly found in pleural fluid, point to malignant growth. These cells are ten to twenty times as large as the leucocytes and contain many vacuoles *(Riesenvacuolenzellen)*.

Dulness or flatness over the upper portion of the sternum is often present. A flat note at one of the apices, with either absence of breathing and fremitus or tubular breathing and absent fremitus, naturally makes one suspect tumor; but, as we have said above, we may have

practically any and almost every physical sign which pathological conditions in the lungs may bring about, yet none are pathognomonic. The X-ray was used in both of our cases and only showed darker shadows where the new growths were situated.

The duration of the disease is, on the average, from six to eight months.

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ON A CASE OF COMPLETE FIBROUS OBSTRUCTION (CONGENITAL?) OF BOTH SUPERIOR AND INFERIOR VENÆ CAVÆ IN A YOUNG MAN OF EIGHTEEN YEARS. FIRST RECORDED CASE.

By Alfred Meyer, M.D.,
attending physician.

Enough cases of complete obstruction of *either* the vena cava superior *or* of the vena cava inferior alone have been published to rob cases of this kind of some of their interest. Thus Welch[1] reports 140 cases of obstruction of the inferior vena cava from thrombosis, without considering other causes of closure. Still, every instance of this kind, independent of the question of rarity, is of great interest from the point of view of diagnosis, etiology, and the establishment of collateral circulation. But when this obstruction implicates both venæ cavæ, as in the case whose history and postmortem follow, this interest is enhanced manifold. A very diligent search of the literature of all countries has failed to discover the report of another similar case. I believe, therefore, that it is the first case of the kind on record.[2]

The patient was a young man (H. S.), single, sewing-machine operator, aged 18 years, admitted to Mount Sinai Hospital September 16, 1902.

Family History.—Practically negative. Father 47 years old, healthy; had married at age of 22 years and had never had any venereal disease. Mother 47 years, healthy. There were seven children, of whom one had died at age of 14 years of Asiatic cholera.

Previous History.—Had Asiatic cholera seven years ago, at the time his brother died of the same disease; also had measles. Four years ago was told by a physician that he had kidney disease and water in the abdomen. Otherwise negative; in particular no scarlet fever,

[1] Allbutt's System, vol. vi., p. 217.

[2] Cayley published a case under the misleading title of "Obstruction of Both Venæ Cavæ" in Middlesex Hospital Report, 1891, London, 1892, page 61, which appears to have been merely a case of simple mitral stenosis and insufficiency with failing compensation, and therefore need not be considered further.

diphtheria, pneumonia, typhoid, rheumatism, malaria, or jaundice. No venereal disease, no alcohol, no tobacco.

Present History.—One year ago began to have ulcers on legs. These healed after some time, but broke open again some months ago. Was able to work hard on a sewing machine until four weeks before his admission. Since that time his abdomen began to swell gradually, as did his left foot and scrotum. One week before his admission abdomen was tapped and three litres withdrawn. No headache, no eye symptoms. Urine high-colored. No cardiac symptoms. Cough and dyspnœa, which were relieved by the tapping previously alluded to. No vomiting nor anorexia. Bowels costive. No loss of weight.

Physical Examination. General Condition: Poorly nourished. Tongue moist and slightly coated. Teeth and gums in poor condition, but no Hutchinson's teeth. Mouth and throat otherwise negative. Skin dark and muddy, especially in axillæ. No icteric discoloration of conjunctiva. Numerous scratch marks on arms, face, neck, chest, and abdomen. Wound at site of paracentesis abdominis. Anterior and posterior cervical glands enlarged; also axillary glands and glands leading from right axilla to right breast. Slight enlargement of epitrochlear glands and marked enlargement of inguinal glands. Two large ulcers on the anterior surface of left leg; one on right leg with foul discharge. Signs of numerous smaller healed ulcers. Small scars on posterior surface of neck; numerous scars on scalp. Marked dilatation of the veins of the chest and side of the abdomen, also of lower abdominal veins. Some dilatation of the veins of the neck and back and of both upper and lower extremities.

Lungs: Anteriorly: Some dulness lower part of right and left axillæ. Slight dulness behind upper part of sternum and at left apex. Posteriorly: Dulness left apex and interscapular region. Some dulness both bases. Otherwise negative.

Heart: Right border just outside of sternum; left border just outside of nipple line. Action slow, regular, faint aortic sound. No murmurs. Apex beat, fifth space, inside the nipple line (?). Pulses equal. Slight thickening of arteries (?). No tension.

Liver: Upper border: Sixth rib, mammary line; sixth space, axillary line. Lower border: 5.5 cm. below free border ribs, mammary line; 5 cm. below free border ribs, axillary line; 6 cm. from tip of ensiform, midsternal line. Surface smooth, edge sharp, hard.

Spleen: Seventh rib, two fingers in front of the anterior axillary line. Palpable two fingers below free border of ribs. Edge hard and sharp.

Abdomen: Lax; tympanitic in centre, dull at flanks; change of note on change of position. Circumference of abdomen, 81 cm.

Extremities: Some edema and cyanosis of feet.

Blood Examination: Red, 4,550,000; white, 6,000; hemoglobin, 70 per cent. Blood spread, negative.

Urine: Acid: 1024; albumin, trace; no sugar; 2.2 per cent. urea; microscopical examination negative.

Temperature on admission, slightly above normal, pulse 106, respiration 26. The patient was at once placed upon fifteen-grain doses of sodium iodide t. i. d., and mercurial inunctions, half-ounce q. d., by Dr. H. W. Berg, Adjunct Physician.

Subsequent History.—Patient was first seen by me on October 11, 1902. The absence of any visible apex beat was noted, with normal cardiac dimensions and pure, though somewhat distant, heart sounds. A presumptive diagnosis of total pericardial adhesion was made, although confirmatory evidence in the shape of pulsus paradoxus was looked for in vain, and there was, of course, in the absence of any apex beat, no systolic retraction. Still, this diagnosis seemed best to explain the obstruction to the circulation in both the upper and lower halves of the body, with the attendant enlargement of the superficial veins, the cyanosis, the edema, the ascites, the enlargement of liver and spleen, and the ulcers on the lower extremities. For, in the absence of valvular lesion, total pericardial adhesion has been found repeatedly without any hypertrophy of the heart, and when present in children has even led to some atrophy of that organ.[3] The widespread enlargement of the lymphatic glands, it was thought, could be explained in one of three ways, none of which was incompatible with the diagnosis of total pericardial adhesion—first, because of backward pressure in the thoracic duct in the absence of free anastomosis with the right lymphatic duct, as described in thrombosis of left innominate vein by Ormerod and Sydney Martin[4]; second, because of a possible syphilis, which might be at the same time the underlying cause for the presumptive total pericardial adhesion; third, because of the cachectic state of the patient.

There was a gradual increase in size of the abdomen, in spite of rest in bed and the use of digitalis, so that on November 7 the circumference equalled 87.5 cm. (See Fig. 1.)

November 30: Abdomen was tapped and over three quarts of turbid, yellow fluid were withdrawn. The fluid presented the following characteristics: Specific gravity, 1011; alkaline; no sugar, no bile, no urea, no iodine (in spite of large amounts of NaI taken); albumin, 1.5 per cent. Did not clear up on shaking with ether. Microscopical examination: An occasional fat globule, a few red blood cells.

December 1: Slight icteric discoloration of conjunctivæ. Circumference of abdomen, 79.5 cm. Ulceration on extremities healed.

December 12: Circumference, 85 cm.

January 7, 1903: Temperature rose suddenly to 104.8°. Somewhat more cyanotic.

January 8: Fever ranges between 101° and 103.6°. Complains

[3] Allbutt, System of Medicine, vol. vi., p. 786.

[4] Allbutt, loc. cit., p. 443.

of sore throat. A few patches of exudate visible on tonsil and pharynx. Throat culture negative.

January 9: Feeling better. Temperature 100°-102°.

January 10: This evening temperature again arose to 104.8°.

January 11, A.M.: Complains of pain in right leg. On inner surface of right thigh is a red and painful area, 4 by 6 inches, that is tender, sharply defined, not indurated. Right inguinal glands much enlarged and tender. Indications of lymphangitis extending between inflam-

FIG. 1

matory area and groin. Temperature at 11 A.M., 107.2°, when he was removed to isolation house for erysipelas, in a very feeble condition, with a pulse of 170. A pale red area extended then as far as the umbilicus. Vigorous stimulation and antipyretic treatment reduced his temperature to 104° and pulse to 140. He also received 20 c.c. antistreptococcic serum.

January 13: Erysipelatous redness has extended down to ankle over sacrum and left trochanter. Periods of delirium. Septic odor of breath. Marked cyanosis of face and hands. Fever between 104° and 105°.

January 14: Death at 8 A.M.

POSTMORTEM BY DR. E. LIBMAN, ASSISTANT PATHOLOGIST, FIVE HOURS AFTER DEATH, THROUGH ABDOMINAL INCISION.

Marked rigor mortis. Edema of both extremities, of slight degree. Pigmentation of both legs anteriorly. General icterus. Body fairly well nourished. General glandular enlargements (as described in clinical history). Dark-red infiltrated area at right thigh extending up over abdomen to umbilicus. Ears dark blue in color. Small hemorrhagic area at posterior margin of auricles. Veins of abdominal wall distended and very prominent; this is particularly true of lateral veins.

Abdomen.—Adhesions between abdominal wall and liver. Large amount of bile-stained fluid in abdomen. Spleen adherent to abdominal parietes, rotated so that it lies transversely with lateral surface anterior.

Thymus.—Small.

Lungs.—Right: Large amount of bile-stained fluid in pleura; lung compressed; congestion of lung; slight edema. *Left:* Markedly adherent; sacculation of fluid at base and between diaphragm and lung. Parenchyma as in right lung.

Pulmonary Vessels and Bronchi.—Negative.

Bronchial and Mediastinal Nodes.—Bronchial nodes all enlarged, pigmented; some soft, others quite firm. Most are grayish in color. Size, up to about that of lima beans. Mediastinal nodes same, only slightly pigmented. In a few bronchial nodes some tubercles are present.

Heart.—Moderate increase of fluid in pericardium. No adhesions. Heart rather small. Cavities not enlarged. Slight thickening of free edge of mitral and aortic flaps. Some thickening of endocardium between aortic and mitral valves. Heart muscle cloudy, brownish. Coronaries and aorta negative. No congenital lesions.

Measurements and Weights. Heart weighs 210 grammes. Length of left ventricle, 8.5 cm. Tricuspid ring, 12 cm. in circumference. Mitral ring, 9 cm. in circumference. Pulmonary, 5.5 cm. in circumference. Aortic, 6.5 cm. in circumference. Diameter of coronary sinus, 0.5 cm. Arch of aorta, 4.5 cm. in circumference. Thoracic aorta, 4.0 cm. in circumference.

Spleen.—Very large, firm, adherent to parietes. On section, marked congestion. Malpighian bodies enlarged. Increase of connective tissue. Measures 9.5 by 14.0 by 18 cm. Weight, 1,000 grammes (29 ounces).

Kidneys.—Somewhat enlarged. Weight together, 420 grammes (14 ounces). Capsule slightly adherent. On section, quite firm, cloudy; quite marked congestion of parenchyma and injection of vessels of surface.

Adrenals.—Right: Embedded in, and compressed by, a mass of connective tissue on under surface of liver. Adrenal very flat, dark

brown in color. No differentiation between medulla and cortex. *Left:* Small, dark brown in color.

Liver.—Very much enlarged. Extends to umbilicus. Quite firm and adhesions to parietes. Marked perihepatitis on lower surface of right lobe, especially about transverse fissure. Surface of right

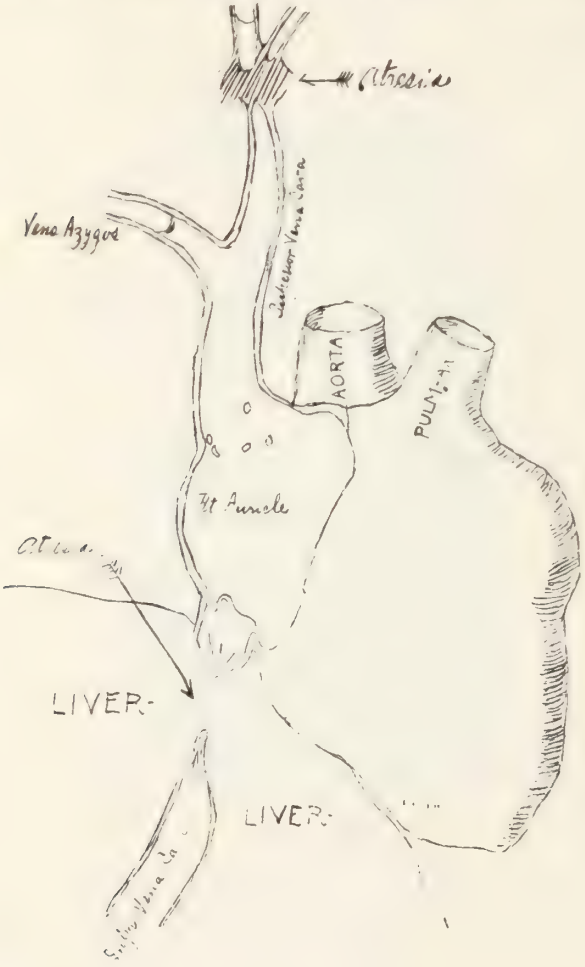

FIG. 2.

lobe anteriorly very granular. As a whole the surface of the liver is quite irregular, with a slight tendency toward lobulation. There is a marked perihepatitis on upper surfaces. On section, liver quite firm, brownish in color, surface looks rather spongy. Branches of hepatic veins enlarged. Central veins all enlarged. *Measurements:*

Weight, 2.36 kilogrammes (5 pounds 1 ounce). Width, 25 cm. Length of right lobe, 19 cm. Length of left lobe, 14 cm. Thickness (right lobe), 9.5 cm. Lymph nodes about transverse fissure much enlarged, dark reddish gray in color. Ductus venosus obliterated.

Portal Vein.—Does not appear to be much compressed by the adhesions or nodes. Circumference of vein, 2 cm.

Gall Bladder.—Cystic duct completely stenosed by adhesions. Gall bladder very small. Wall thick, whitish; pale mucoid fluid in gall bladder, very pale yellow in color. Common duct rather narrow (but no stenosis at or near papilla). Hepatic ducts rather large. Hepatic veins, diameter of each, 1 cm.

Pancreas.—Very firm; ducts not obstructed.

Stomach.—Moderately dilated. Mucosa swollen. Hemorrhagic areas, especially near pylorus.

Intestines.—Practically negative. Veins are moderately enlarged.

Mesenteric Nodes.—Very large, most size of lima beans; most are pale, some dark reddish in color. There seems to be quite some thickening of the mesentery and of the various mesocolons.

Prostate and Bladder.—Negative.

Head.—Not opened.

Cava (Figure 2).—Superior cava ends 6 cm. above auricles. Its circumference, 3 cm. Near the termination of the cava the wall is somewhat thickened. On the left side near the stenosis (about 1 cm. below it) is a small, irregular tab on the wall. Above the atresia for a distance of one-fifth cm. there is only some fibrous tissue in which both innominate veins end. They are both small, the left being the smaller. The walls are quite thick. The right has a valve. There is no evidence of any inflammatory process at or near the atresia of the cava. The vena azygos major quite large; opens into the cava at the usual location. Its circumference is 2 cm. There is a valve near its point of entrance.

Inferior Cava.—Shows atresia at the diaphragm; there is fibrous tissue about 1 or 1 1-2 cm. thick about its termination. The upper end of the cava is rather conical, the wall quite thickened, the atresic part is surrounded by the area of perihepatitis on the upper surface of the liver (but the vein does not appear to be affected by the perihepatitis). Circumference of inferior cava at widest part (behind liver), 4 cm.

MICROSCOPICAL EXAMINATION BY DR. F. S. MANDLEBAUM, PATHOLOGIST.

Lung.—Moderate amount of fibrinous exudate on pleura. Intense acute congestion with numerous hemorrhages into lung tissue. Moderate edema. Moderate anthracosis.

Heart.—Parenchymatous degeneration. Brown atrophy.

Pancreas.—Chronic interstitial inflammation. Islands of Langerhans not involved.

Spleen.—Intense acute congestion with hemorrhage. A few small areas of purulent inflammation. Gram's stain shows streptococci in these areas.

Kidney.—Intense acute congestion with hemorrhages. Moderate increase in amount of interstitial connective tissue. Slight cloudy swelling.

Adrenal.—Intense acute congestion with hemorrhage. Slight increase in interstitial connective tissue of cortex.

Liver.—Chronic congestion. Acute congestion with hemorrhage. Blood pigment. Perihepatitis. Large amount of connective tissue surrounds inferior vena cava.

Mediastinal Nodes.—Chronic interstitial inflammation. Acute congestion.

Mesenteric Nodes.—Show similar changes, also a pronounced dilatation of the lymphatic vessels.

If this case is studied in the light of the postmortem evidence, it is at once apparent that the entire return circulation was provided for by the dilated vena azygos major. Under these circumstances the amount of distension of the superficial veins during life, particularly in the territory drained by the superior vena cava, was strikingly little, in fact much less than has been repeatedly observed in closure of one of these great trunks alone. This may possibly have been due to the gradual and slow manner of closure of these vessels, permitting a great deal of time for the establishment of the deep and superficial collateral circulation. In fact, a rapid obliteration of either superior or inferior vena cava, as by a thrombus, probably leads to a rapid death; and this result is in conformity with the results of animal experiment. Picard[5] tied the inferior vena cava in animals above the liver, and they all died within one-half to four hours, with increasing frequency and diminishing force of the systole—the animals practically bleeding to death into the vessels below the diaphragm.[6]

In a study of the subject Eppinger says[7] that obliteration of the superior vena cava is almost always found at a point just below the entrance of the vena azygos. This is not so in my case—in fact, had it been so, it would have been incompatible with life.

The relatively lesser distension of the vein of the upper half of the body in my case must be explained by the fact that the return circulation is here not against the force of gravity, because mainly di-

[5]Comptes-rendus de l'Academie des Sciences, Paris, 1880, xc., p. 100.
[6]See also Gazette des Hôpitaux, Paris, 1880, liii., p. 99.
[7]Prag. med. Woch., 1876, i., p. 725.

rected downward toward the heart, while the reverse is the case in obstruction of the inferior vena cava; and in the latter case the circulation is in part contrary to the direction of the normal circulation. This difference, in closure of the two veins respectively, has already been alluded to by Eppinger,[8] though he did not have an opportunity of observing the effect of closure of both of these vessels in one subject.

On the other hand, there are recorded a number of cases of complete closure of the inferior vena cava without any enlargement of superficial veins. Thus Andrew[9] reports the case of a woman aged 35 years who died at St. Bartholomew's Hospital of epithelioma cervicis uteri and amyloid degeneration of spleen, liver, kidney. The inferior vena cava was closed, for about an inch from a point just below the entrance of the right renal vein, by an organized clot, which converted the vein into a fibrous cord. She had had an attack of dropsy ten months before death, from which she had recovered. Feet were swollen last two months of life, *but there was no enlargement of superficial veins.* Bloch[10] quotes a case from Ziemssen's "Handbuch der speciellen Pathologie" in which there was a cicatricial obstruction of the inferior vena cava below the renal veins with no distinct symptoms. Griffith,[11] in a man who died at the age of 55 years, found the inferior vena cava completely closed just above renals—*i.e.*, at a point between them and the hepatic veins. *No superficial veins enlarged*, no evidence of obstruction, and the man died of other causes.

Late Appearance of Large Veins in Obstruction of Inferior Vena Cava.—Cavasse[12] found a probably congenital atresia of the inferior vena cava at a point below the renal vein, where the inferior vena cava ended in a filiform extension, in a man dead of pneumonia at age of 54 years. Enlargement of veins on the abdomen and blue spots appeared only two years before death.

Closure of Superior Vena Cava; No Evidence of Obstruction.—Banti[13] describes a man who died at the age of 46 years of acute miliary tuberculosis, in whom the superior vena cava was converted into a hard and resistant cylinder 5.6 cm. in circumference and there

[8]Loc. cit.
[9]Trans. Path. Soc. Lond., 1864-1865, xvi., p. 92.
[10]Ueber Obliter. der Vena Cava Inferior, Jena, 1880.
[11]Scalpel, London, 1899, iv., p. 13.
[12]Bull. Soc. Anat. de Paris, 1897, lxxii., p. 811.
[13]Sperim. Mem. Orig. Firenzi, 1891, xlv., p. 408.

was no evidence of stasis in head, neck, or upper extremities. In the majority of cases, however, closure of either of these vessels leads to enlargement of superficial veins, without whose presence the underlying condition would scarcely be suspected, much less diagnosticated. Thus Claverie[14] describes the case of a man who died at the age of 52 years in whom the superior vena cava was converted into a fibrous cord for a distance of 1½ cm. at a point below the entry of the azygos vein; in addition there was a total pericardial adhesion. The patient had had great varicosities on the sternum and from the axilla to Scarpa's triangle for thirty years.

Albuminuria.—Welch says that in thrombosis of the inferior vena cava albuminous, bloody urine is more often lacking than present. This is an interesting fact. In my case there was persistent absence of albumin, and of other evidence of congestion of the kidneys, until a few days before death, and then it was undoubtedly due to the fatal complication. Bloch[15] reports the case of a man 55 years old in whom he found a thrombosis of the external iliac veins and both common iliac veins and of the inferior vena cava up to 40 mm. from foramen quadrilaterum (*i.e.*, far above entry of renal veins), and in whom there had been no albuminuria.

Prognosis.—During a considerable part of last century the prevailing notion was that closure of the main vein of an extremity meant the gangrene of that extremity. Hence it is not surprising to note that in 1826 a professor of surgery in France ligated the femoral artery for a wound of the femoral vein, not daring to risk (as he thought) a gangrene of the lower extremity by ligating the wounded vein. In 1858 Claverie[16] combated this view as erroneous, citing anatomical facts from the cadaver, results of surgical experience and of animal experiments against it. Still many able surgeons continued to be guided by the earlier theory until the end of the nineteenth century. A case like the present one illustrates strikingly how excessive have been these fears of gangrene, and how wonderful are the provisions for collateral circulation. Leaving out of consideration at this point the question of the probable congenital origin of the trouble, we have in the boy's history excellent proof of at least a four years' duration before his death, for he had been told by a physician at that time

[14]Reflex. sur cas d'Oblit. du Veine Cave Sup., Paris, 1858.
[15]Loc. cit. [16]Loc. cit.

that he had kidney disease and *water in the abdomen*, and the nearest approach to gangrene subsequently were the ulcers on the legs referred to in the history (one year before admission), and even they had healed repeatedly. As it is, the boy's death was finally due to erysipelas, a cause only indirectly connected with the obstructed venæ cavæ (infected puncture wound), and, barring this occurrence, his condition at the time warranted the belief that he had many more months to live.

Claverie's case of obliteration of the superior vena cava already referred to lasted at least thirty years. In this connection it is interesting to note that the capacity of the veins to that of the arteries of the body is variously estimated. Borelli gives 4 to 1, Sauvages 9 to 4. Haller 2 to 1, and Sappey 2 to 1. Even taking the most conservative estimate as the correct one, this fact is of enormous advantage in overcoming the effects of occlusion of a large vein like either vena cava.

Collateral Circulation.—W. Thomas[17] has perhaps made the most complete study of both the superficial and deep routes connecting the superior and inferior venæ cavæ and available in obstruction of either or, as in my case, of both. In my case the *superficial* route was probably as follows:

(*a*) Vena cava inferior.
" iliaca communis or vena femoralis.
" circumflex ilei tegminis.
Truncus anastomot. lumbo-vertebralis.
Sinus vertebralis externi.
Vena azygos.
" cava superior.

The *deep* route probably as follows:

(*b*) Vena cava inferior, either direct or *via* vena hypogastrica to
Vena lumbalis ascendens.
" azygos.
" cava superior.

(*c*) Vena cava inferior.
" renalis (dextra or sinistra).
Vertebral sinus.
Vena hemiazygos (or azygos).
" cava superior.

[17]Beitrag zur Differentialdiagnose zwischen Verschluss der Pfortader und der unteren Hohlader. Bibliotheca Med. D., No. 2.

Route (*b*) has been demonstrated experimentally by Schwartz and Walther.[18] After ligature of the inferior vena cava in animals, they have succeeded in forcing foreign bodies by this route from the common iliac vein into the right auricle.

The picture of the patient taken during life shows not only the ascitic distension of the abdomen, but especially the enlarged veins in the latero-abdominal area. It has been found repeatedly that enlargement of veins in this area rather speaks for obstruction in the inferior vena cava, while when the enlargement is mainly present on the anterior abdominal wall and about the umbilicus the probability is in favor of obstruction in the portal system. My case supports the correctness of the generally accepted view.

Etiology.— In the larger number of cases the closure of the vena cavæ is due to thrombosis extending into them from tributary veins (as after typhoid, in inferior vena cava) and from pressure of various kinds of tumors (aneurisms, new growths, lymphadenomatous and tubercular glands). Still there have been published a large number of cases of atresia of the vena cava, the etiology of which has been obscure. In a few cases the authors have believed syphilis to be the etiological factor. A process of this nature might have been the cause of the atresia of the inferior vena cava in my case, in which the inflammatory adhesions to the liver presented at first sight the appearance of a healed gumma. On the other hand, the atresia of the superior vena cava was not at all suggestive of such an etiology, and it is reasonable to look for a common cause for both. In addition there was no clinical evidence of either acquired or congenital syphilis in the boy nor in his father; nor was there other evidence of either recent or old syphilis disclosed by the postmortem examination, the ulcers, scars, and even large lymph nodes being due to the severe chronic congestion. It is of course possible, but not probable, that one of the lesions was congenital and the other not. In the case published by Eppinger[19] the condition and localization in the inferior vena cava resembled very closely that of my own case. At a distance of 21 mm. from the auricle the inferior vena cava came to a point, and was then closed for a distance of 7 mm. and converted into a cord of the thickness of a quill; below the closure a gradual enlargement of the vessel, and its walls were united to a hepatic scar. He reached the conclusion that it was:

[18]Quoted by Thomas, loc. cit.

[19]Loc. cit.

(1) A syphilitic hepatitis, with development of scar tissue.
(2) Involvement of the inferior vena cava in the scar tissue, then
(3) Cicatricial occlusion of the inferior vena cava.

He also quotes a case reported by Klebs[20] of a boy 12 years of age in whom hereditary syphilis was demonstrated, including fresh syphilitic deposits in the liver and an obstruction (partial) of the inferior vena cava by scar tissue emanating from a gumma at the identical situation in the vein as in Eppinger's case. If lues was the etiological factor in my case, it would put it in the same category as the cases of endophlebitis obliterans of the hepatic vein (supposedly due to syphilis), described in recent years by Chiari,[21] Churton and Lazarus Barlow,[22] Kelyneck,[23] and Lichtenstern.[24]

Jastrowitz[25] published a case of thrombosis of the portal vein of syphilitic origin. There was a whitish-yellow gumma about the size of a walnut projecting into the portal vein, from which the thrombus started, and there was a syphilitic cicatrix in the liver. Schüppel[26] reported three cases in new-born children of gummy peripylephlebitis, affecting either the trunk of the portal vein or one of its main branches, the vein being changed into a thick, dense cord with a much contracted lumen. One case lived eight and a half days, another only eight hours.

In other cases the authors have believed a phlebitis (either exo- meso- or endo) to have been the cause, without assigning a syphilitic or other basis for the phlebitis. That there may be marked phlebitis without closure of the vein has been shown by De Giovanni,[27] and sometimes accompanied by marked hypertrophy of the muscular coat. In one case this hypertrophy was so marked that the vena cava was with difficulty distinguished from the esophagus.

As curiosities I would mention a case reported by Thompson[28] in which a needle which had probably been swallowed was the cause of a thrombosis of the inferior vena cava; and another by Peacock[29] of a man 68 years old in whom the lower two-thirds of the inferior vena

[20]Handbuch der path. Anat., p. 447.
[21]Beiträge zur path. Anat., Band xxvi.
[22]Trans. Path. Soc. London, 1899.
[23]Med. Press and Circular, vol. cxv., 1897.
[24]Prag. med. Woch., 1900, xxv., p. 325.
[25]Deutsch. med. Woch., Berlin, 1883, ix., p. 682.
[26]Ziemssen's Cycl. Pract. of Med., vol. vi., p. 493.
[27]Wiener klin. Woch., 1893, vi., p. 578.
[28]Trans. Clin. Soc., vol. viii., p. 19.
[29]Lond. Med. Chir. Trans., 1845.

cava was closed by a calcareous concretion extending into the right and left iliac veins. Banti[30] reports the closure of the superior vena cava by a tubercular endophlebitis.

Hirtz and Henniquin[31] have attempted to show that there exists in certain families a veritable "arthritisme veineux," a "hérédité veineuse," or a "phlébite familiale"—an hereditary disposition to phlebitis and other venous affections. An investigation shows that nothing of this kind could be asserted of the family to which this boy belonged.

[30]Loc. cit. [31]Bull. Méd., Paris, 1901, xv., p. 389.

A CASE OF PRIMARY ADENOCARCINOMA OF THE DESCENDING PORTION OF THE DUODENUM.

By N. E. Brill, A.M., M.D.,
ATTENDING PHYSICIAN.

The rarity of neoplasms involving the duodenum is in itself sufficient reason for the publication of this case.

The patient, Abraham N., was admitted to my service in Mount Sinai Hospital on April 6, 1902. The following data were elicited:

Family History.—Was negative.

Previous History.—He had typhoid fever three years ago, malaria twenty years ago. He never had jaundice before. Otherwise the history is negative.

Present History.—He began to suffer nine months ago with epigastric pain, which radiated to the right hypochondrium, but not to the shoulder or back. There was vomiting once or twice weekly, generally after eating. He had some fever the first week, but never any chills. He continued to have moderate pain until five months ago, when jaundice supervened and the pain disappeared; the pain then shifted to the right hypochondrium and persisted. The jaundice gradually increased. For a period of four weeks, four months ago, the stools were clay-colored. At times during the period of jaundice there was itching of the skin. His appetite has been good, but he was constipated and had to use cathartics.

One week ago, for a period of four days, he had edema of both legs. He has never been compelled to lie in bed, and the pain with which he suffered had never been intense. He lost some in weight.

Present Status.—His general condition is good; he is fairly well nourished, his weight being 129 pounds, his stature being small. He is deeply icteric. The tongue is moist and coated. The uvula is bifid, otherwise the throat presents nothing abnormal. He is markedly anemic. The teeth and gums are in fair condition. The glands in the groin are slightly enlarged. There are no other palpable glandular enlargements.

The heart and lungs were normal; the pulse ranged between 72 and 100.

The liver dulness extended from the fourth interspace to the sixth rib, and flatness to the costal margin in the mammillary line. There was a palpable movable tumor in the gall-bladder region. The free border of the liver could also be felt.

The spleen was not palpable; the abdomen showed no abnormalities and there was nothing to be noted about the extremities.

The following was noted on April 9, 1903: The feces are grayish brown in color, show traces of bile, the odor is sour, and they contain a moderate number of bacteria and muscle fibres, with many fat globules and fat crystals. The blood count shows: red blood cells, 4,800,000; white blood cells, 5,400; hemoglobin, 35 per cent.

On April 12 the jaundice was much diminished, no pain present, no tenderness anywhere. The liver is somewhat larger, its lower edge being hard and palpable midway between costal border and umbilicus in parasternal line. The feces were the same as on April 9, containing muscle fibres, fat globules, and fatty crystals.

On April 14 the jaundice had almost gone, having steadily diminished since his admission. This morning he complained of pain in the right hypochondrium and in the right iliac region. His weight is less—117 pounds.

April 16: The jaundice is once more intense, having quickly reappeared since yesterday.

April 17: The sclerotics are deep greenish yellow; the skin of the body is now brownish yellow. His general condition is good.

The urine showed during this period a specific gravity of 1020, no albumin, no sugar, a decided reaction for bile. A few granular casts were noted.

The temperature ranged between 98.6° and 101° F.

The diagnosis wavered between a stone in the common duct at the ampulla and a carcinoma of the head of the pancreas. It was thought that either of these conditions would explain the varying jaundice and the fat, etc., in the feces, which pointed to an interference with the discharge of the pancreatic secretion.

The indications for surgical interference were sufficiently marked to call for the services of my colleague, Dr. Gerster, to whose service the patient was transferred for an exploratory laparatomy.

When the abdomen was opened a tumor mass was felt in the neighborhood of the duodenum and head of the pancreas, which being declared inoperable, the distended gall bladder was emptied by a small incision, the edges were reunited, and the abdominal wound was closed.

The patient died on April 21.

A wound examination eighteen hours after death disclosed the following:

An incision is found in the right hypochondrium 10 cm. long. The wall of the gall bladder is thickened, and in the fundus is a small incision inverted and sewed up. The gall bladder is full of blood, partly clotted; the edges of the incision are raw and hemorrhagic. Blood is found in the biliary ducts and in the intestines down to about 30 cm. above the ileocecal valve.

In the *duodenum* is a growth lying at and about the papilla of Vater. The growth is annular and 8 cm. in diameter: it is white, soft, with its edge overhanging. On incising the tumor much juice

can be scraped off. The opening of the choledochus duct is not entirely obstructed, but the growth overlaps the opening. The pancreatic duct is obstructed at its orifice. The orifice lies about one-half cm. below the orifice of the common duct, the new growth intervening. The entire pancreatic duct is dilated, and the pancreatic tissue is reduced in amount and is quite firm.

There is great distension of the ascending and transverse colon.

The liver is enlarged, congested, and bile-stained.

The kidneys have adherent capsules, are congested and bile-stained.

The microscopical examination of the specimens was as follows:

The growth is an infected adenocarcinoma.

The kidney shows an interstitial nephritis and acute degeneration.

The liver is the seat of a biliary cirrhosis.

The pancreas is affected by an interstitial inflammation.

Leichtenstern[1] collected from his own and published cases, and from records of pathological institutes and hospitals, 154 cases of intestinal carcinoma, of which 17 involved the duodenum and jejunum, and 16 the ileum.

In Guy's Hospital there were 18,000 autopsies, in which primary malignant disease of the duodenum was found in 10; of these 10, 4 were cases of carcinoma (Rolleston[2]).

Maydl reports that between the years 1870 and 1881, inclusive, 20,486 autopsies were performed at the Pathological Institute of the Vienna General Hospital, of which 1,460 were cases of malignant neoplasms. Of these, 100 had their seat in the small intestine, of which only 2 were in the duodenum. To Maydl's statistics Nothnagel adds that from 1881 to 1893, inclusive, at the same Institute, there were 21,358 autopsies, 2,125 of which were on cases of malignant growths. These involved the small intestine in 243 instances, of which in 5 the seat was in the duodenum.

A. Zemann, from similar tabulated statistics, reports 165 cases of cancer of the intestines, of which 3 had their seat in the duodenum.

George Heimann's statistics show that during the years 1895 and 1896 there died in the general hospitals of Prussia 20,054 patients with cancer, of whom 1,706 had some part of the intestinal tract involved: 20 of these cases had carcinoma of the small intestine (the number attacking the duodenum is not specifically mentioned).

Computing the figures of Maydl, Nothnagel, and Zemann, we find

[1]Ziemssen: Handbuch der speciellen Pathologie und Therapie, Bd. vii., 2. Hälfte, 1878.

[2]Rolleston: The Lancet, April 20, 1901, p. 1122.

that out of 508 cases of carcinoma of the small intestine, only 10, or 1.9 per cent., originated in the duodenum.

When carcinoma affects the small intestine its seats of predilection are the duodenum and the lower part of the ileum near the ileocecal valve. The jejunum is so rarely attacked that it may be considered a rarity of rarities. Carcinoma of the duodenum appears more frequently than sarcoma. Libman collected, however, 15 cases of sarcoma of the duodenum. Sarcoma is more frequent in the jejunum and ileum.

When the duodenum is attacked by carcinoma, the second or descending part is the usual site of growth. It is rather difficult to determine whether the duodenum is more or less frequently the site of malignant neoplasms than the ileum, because the majority of the cases of the latter affect the ileocecal valve and on that account are classified by some as malignant disease of the small intestine, by others as neoplasms of the large intestine. It is probable that the duodenum is not as frequently attacked as the ileum.

Carcinoma of the descending portion of the duodenum is usually near the papilla. The seat of carcinoma in the region of the papilla Vateri may be classified as follows:

1. Carcinoma of the duodenal surface of the papilla of Vater.
2. Carcinoma of the ampulla of Vater.
3. Carcinoma of the termination of the choledochus duct.
4. Carcinoma of the end of Wirsung's duct.

Cases of each kind have been reported. This classification has more an anatomical than a clinical importance. Clinically, diagnosis of these anatomical conditions is well-nigh impossible.

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A CASE OF CHOLESTERIN PLEURISY.

By Morris Manges, M.D.,
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The extreme rarity of the presence of large quantities of cholesterin in the fluid aspirated from the pleural cavity is attested by the fact that a careful search of the literature has yielded but four cases. The condensed details of the present case are as follows:

T. J., aged 32 years, electrician, was admitted to Male Ward 2 on April 18, 1901.

Family History.—Negative. No tuberculosis.

Previous History.—He had left pleurisy ten years ago; on aspiration clear serum was obtained. After this attack had lasted four months he remained in fair health, excepting occasional attacks of pain in the left chest. He was never in bed, nor, so far as he knew, did he ever have fever.

Present History.—In December, 1900, he had an attack of what was called grippe, the symptoms being fever, cough, and dyspnea on exertion; no expectoration or hemoptysis. The cough and dyspnea increased in severity, and were accompanied by pain in the left chest and some fever. For the past three weeks all symptoms having become more marked, he entered the hospital.

Status Præsens.—General condition very good. *Lungs:* Left anterior, dull at apex, becoming flat at third space. Absence of voice, breathing, and fremitus over this area. Posteriorly, dulness over entire left chest to angle of scapula, flatness from here to base. Diminished voice and breathing over dull area; absence of both over flat area. Right lung shows signs of compensatory emphysema. *Heart:* Displaced to within one inch of right nipple line. Sounds normal. Other organs all negative.

On aspiration of left chest 60 ounces of fluid obtained. This was of opaque, brownish color, and on standing soon deposited a thick sediment, which on microscopical examination proved to be entirely composed of cholesterin crystals. No cells of any kind could be found.

Considerable relief followed the aspiration, and general condition improved. Repeated examinations of the scanty sputum were negative. On May 10 aspiration was again necessary, 30 ounces being withdrawn. The color was slightly more yellowish and contained some polymorphonuclear leucocytes in addition to the abundant cholesterin crystals.

Although the dyspnœa and pain were relieved, he now had a persistent afternoon temperature ranging between 101.4° and 102°.

Examination of the sputum showed few pus cells, numerous cholesterin crystals, but no tubercle bacilli.

June 4, again aspirated; pleura seemed to be much thickened; only 10 ounces of the same kind of fluid withdrawn. Eighteen ounces of dilute methylene blue solution injected according to Lewis' method. No special reaction followed the latter.

The temperature fell and remained low (99°-100°) for the next three weeks. But after this the amount of fluid steadily increased, the temperature oscillated between 101° and 103°, and the general condition became decidedly worse. Aspiration of the chest showed that the fluid was becoming purulent; the quantity of cholesterin remained unchanged. Twenty ounces were removed on June 28. July 5: Left chest was again full of fluid, and as the temperature rose above 102° every day and as the patient was rapidly losing ground, operation was advised.

Dr. Lilienthal, to whose service he was transferred, on the following day performed a Délorme's operation upon him. This was done with great difficulty, since the enormous deposits on the diaphragm had stiffened it and prevented its free excursion. In peeling this deposit off the diaphragm a very small hole was accidentally torn in the latter. This was packed with gauze, as it was thought that this would suffice, as it ordinarily does in such cases. On the next day, after an attack of vomiting, he suddenly went into collapse; this was believed to be due to a secondary hemorrhage. On opening the wound the true cause was readily discovered, namely, an enormous diaphragmatic hernia. The spleen, part of the stomach and colon, and some coils of small intestine were found in the pleural cavity. Unfortunately nothing could be done to relieve the patient's condition, and death soon ended the scene. A full autopsy could not be obtained. Examination of the wound revealed the cause of the hernia. As the result of the enormously thick layers of organized deposits on the diaphragm (three-fourths of an inch), its muscular fibres had become so atrophied that the strain of vomiting after the anesthesia had enlarged the small tear in the diaphragm to such an extent that a very large opening was formed which permitted the hernia of the abdominal viscera.

The microscopical examination of the pieces of parietal and costal pleuræ which was made by Dr. F. S. Mandlebaum, Pathologist of the hospital, revealed nothing which could explain the pathological processes which had produced the large quantities of cholesterin, since the only tissues which could be obtained were those in the immediate field of the operation.

The earliest case reported is that of Biermer:[1]

[1]Virchow's Archiv, 1859, Bd. xvi., p. 545.

A military officer, 41 years old, had had an attack of pleurisy fourteen years previously. This resulted in an encapsulated empyema. In spite of this he was able to serve as a cadet and officer for years. His only complaint was occasional attacks of asthma. In the year preceding his death he had a sudden attack of hemoptysis, and then he began to expectorate mucopurulent, chocolate-colored sputum. For two weeks this was in very large quantities (4 to 5 saucerfuls); after this the quantity lessened. On examination it was found to contain enormous quantities of cholesterin crystals and blood-pigment crystals. At first fresh red blood cells were also found. Toward the end of life the sputum became very offensive, and death resulted from exhaustion.

At the postmortem examination, over a litre of very offensive purulent, chocolate-colored fluid was found in the left pleural cavity. It also contained a mass of coagulated fibrin, the size of a child's fist, which on closer examination proved to be composed almost entirely of cholesterin. In the middle of the compressed left lung a perforation was found communicating with a small bronchus. Both layers of the pleura were markedly thickened and were covered with soft exudate which was quite adherent in different places.

In the discussion of this case Biermer asserts that in repeated examinations of sputa of all kinds he had never before found cholesterin. The old empyema had remained encapsulated, had undergone degenerative changes with the formation of large quantities of cholesterin, and had given rise to no symptoms except the occasional attacks of asthma, until it had perforated into a bronchus at the time when the hemoptysis occurred and the profuse expectoration began. Biermer concluded that the presence of large quantities of cholesterin in sputum was pathognomonic of the presence of an old perforating empyema.

Churton reports two cases:

Case I.[2] —Man, 38 years old, with previous history which was negative, except that in 1876 he had a large abscess in the left axilla from a wound in the left hand. He was not well after this and lost much in weight in 1878. There were no pulmonary symptoms except dyspnea, pain in the right side, occasional vomiting, and loss of 20 pounds in weight. Suddenly in 1880 he grew worse and was admitted to the Leeds Infirmary. On examination effusions were found in both chests. Aspiration of the left yielded a brownish, greasy fluid containing disintegrated red blood cells and much cholesterin in a highly albuminous fluid which did not coagulate spontaneously. A few

[2]British Medical Journal, Nov. 5, 1881, p. 745; June 17, 1882, p. 907.

ounces of a similar fluid were obtained from the right chest. No disease found in any of the other organs. Temperature normal.

During the following year the left side gave but little trouble. It was aspirated but once, and only a few ounces of a similar light-colored fluid obtained. The right chest gave more trouble and was tapped six times.

His general condition steadily improved until May, 1881, when he caught cold and had fever for the first time. In June and July he was aspirated twice, and large quantities of the same kind of fluid withdrawn from the right chest. For the first time it contained pus cells.

July 10, fluid having returned and the fever reaching 103°, the right chest was incised and 38 ounces of fluid evacuated. Temperature became normal, but soon rose to 103°. Then fluid was again found on left side and 20 ounces of fluid aspirated. Although this was clear fluid, it contained cholesterin. The patient did not improve, and a septic condition persisted till September, when the fever disappeared. A little clear fluid was found in the left chest; no cholesterin in the pus from the right chest.

Churton believes that "the patient had a chronic pleurisy with the formation of a thick false membrane over part of the lungs; that blood cells had, by means of diapedesis, reached the cyst thus formed, and the membrane had undergone fatty degeneration with the formation of cholesterin."

He also directs attention to the rapidity of the formation of the fluid, and to the absence of tuberculosis and liver disease.

The patient did well up to November, when the fever returned; aspiration of the left chest showed pus with cholesterin. The right empyema had healed. Death soon occurred from sepsis.

The autopsy revealed a thick layer of old degenerated cells and lymph containing cholesterin on the floor of the left pleural cavity, but no fluid pus. A few small nodules were present in the apex of the left lung, the latter being considerably compressed. "The origin of the cholesterin was in the degeneration of the cells which had accumulated in the former pleurisy." No such deposits were discovered in the right chest, which was found to be universally adherent. There was no evidence of tuberculosis beyond the few nodules at the apex.

Case II.[3]—Laborer, 31 years old, had suffered for three weeks from debility, chills, cough, and expectoration. On aspiration of the pleura 34 ounces of a cream-colored fluid were withdrawn. Microscopic examination revealed a small number of granular leucocytes and an

[3]British Medical Journal, 1885, vol. ii., p. 396.

abundance of cholesterin crystals. The previous history of the patient was that "two years previously he had had a consolidation of the left lung for eleven weeks." Since this attack he had never been well.

After two aspirations, one of 58 ounces, the other of 32 ounces, the character of the fluid changed, so that the fluid obtained at the fourth tapping (19 ounces) contained very few crystals.

For the first month of his stay in the hospital he had fever; but after that this disappeared and he was discharged very much improved.

The subsequent history of the case is unknown.

The fourth and last case which could be found is that of Kinnicutt,[4] the details of which are very scanty. In reply to a letter which I sent to him, Dr. Kinnicutt replied that unfortunately the case had occurred so long ago that he could supply no further data. At a meeting of the Practitioners' Society Dr. Kinnicutt reported a case in which aspiration of the pleural cavity yielded a fluid which looked like pus but which contained no pus cells. The fluid had a rich creamy color like milk, yet on microscopic examination only granular detritus and cholesterin crystals could be found. The only clinical details are that the man had suffered for two months from an increasing dyspnea, with moderate fever, and had lost flesh. There was no bone disease. A pleurisy with effusion was found and 14 ounces of the above-described fluid were obtained.

Any discussion of this class of cases of pleurisy is rendered extremely difficult, not alone because of the great rarity of cholesterin effusions, but also because our knowledge of the physiological relations of cholesterin is as scanty now as it was in 1859 when Biermer reported his case. And, it may be noted, nothing can be added to his explanation that the cholesterin was the result of the fatty degeneration of the old albuminous products which were left after the empyema. To-day, in spite of the enormous strides which have been made in all departments of physiology, the real relations of cholesterin, both as a normal and as a pathological product, are most vague. As a pathological product all that we know of its formation in old hydroceles, cholesteomata, etc., may be summed up in the sentence that it is the result of the decomposition of albuminous substances with the formation of fats and cholesterin. That this is the correct explanation in the present class of cases may be inferred from the fact that an

[4] N. Y. Medical Record, March 28, 1885.

empyema or old pleurisy was present in all of the cases. But how or why this occurs in these few instances must be left to the future for a satisfactory explanation.

The present case is particularly interesting on account of the very great quantity of cholesterin which was thus formed. Weighing the deposit in a given quantity, and calculating the total quantity which was present in the pleural cavity and removed by the tappings and at the operation, it was found that over a pound of cholesterin was thus formed.

On allowing some of the aspirated fluid to remain in contact with the air, the extreme offensiveness of the fluid within a very short time was very strong proof of the wisdom of the course to do as little tapping of the pleural cavity as possible. In this way only can infection of the pleural cavity be avoided.

This observation should also guide us in the treatment of these cases. The less that is done the better, provided the patient is not suffering from the mechanical effects of the effusion. In spite of all precautions, infection of the pleural cavity is bound to occur, as happened in the present case.

The dangers of a radical operation are also to be noted, and the disastrous effects of a possible diaphragmatic hernia are to be borne in mind. There can be no doubt that the same result might have occurred even if the diaphragm had not been slightly torn during the operation, since the atrophy of the diaphragm, after having been splinted for so long a time by these thick deposits, may be so extreme that any act of vomiting or even hard coughing may precipitate a hernia through the thinned diaphragm. On the other hand, simple incision and drainage may favor infection of the pleural cavity in spite of all precautions. Simple aspiration under the most rigid aseptic precautions seems to be the proper procedure, and this should only be done where the mechanical or other effects of the effusion are so great that life is endangered if it is not performed. Should the fluid become purulent, simple incision and drainage, without any attempts at decortication, are the only indications.

CARCINOMA OF THE STOMACH AND LIVER IN MALE TWENTY-EIGHT YEARS OLD—PERFORATION INTO THE TRANSVERSE COLON.

DIAGNOSTIC AND CLINICAL DATA.

By Henry W. Berg, M.D.,

ADJUNCT ATTENDING PHYSICIAN.

Although carcinoma of the stomach is unfortunately a frequent disease, the following case is of interest from a diagnostic and pathological standpoint.

M. F. entered the hospital August 2, 1902, aged 28 years; Russian; clerk; single.

Family History.—Negative.

Previous History.—Moderately alcoholic; always robust until present illness, otherwise negative.

Present History.—Three weeks' duration. Began with anorexia and pain in the epigastrium, increased after eating and more severe at night; the pain does not radiate. Never vomited. Never had diarrhea. Lost 20 pounds; feels very weak. Skin has become yellowish. No chills or fever; no pulmonary or cardiac symptoms. Legs somewhat swollen during the past week. No eye symptoms. Urination increased both in quantity and frequency. Bowels markedly constipated.

Physical Examination. General condition poor. Patient markedly emaciated and anemic. Several petechiæ on the mucous membrane of the lips. Slight clubbing of the fingers. Small cervical, axillary, and inguinal glands. Some pigmentation of the skin of the neck, axilla, and abdomen. Slight enlargement of the thyroid isthmus. Marked tenderness to percussion over the sternum; slight tenderness over the tibia.

Lungs: Chest somewhat barrel-shaped. Some retraction above and below both clavicles. Hyperresonant note over both sides of chest anteriorly; otherwise negative. Posteriorly, slight dulness of the right apex and left base and right base. Diminution of voice, breathing, and fremitus at the right base.

Heart: Negative, except for the presence of a loud-blowing systolic murmur heard over the left second intercostal space, transmitted upward and heard faintly over the aortic region.

Liver: Dulness fourth space, flatness fifth space to free border, mammary line. Dulness fifth space, axillary line. Liver is palpable 2½ fingers below the free border in the mammary line. Pressure in the intercostal spaces over the liver produces considerable tenderness.

Spleen and Abdomen: Negative.

Extremities: Knee jerk present; no clonus; considerable edema.

Rectal: Negative.

Blood Spread: Leucocytes, 11,000, principally polymorphonuclear neutrophiles. Red cells very pale, a moderate number of megaloblasts, normoblasts, megalocytes, and poikilocytes.

August 4: *Stomach contents:* Total obtained, 2 ounces, foul, gray, poorly digested, hemin present. Total acidity, 15; free acid, 0; combined acid, 5; lactic acid, 0. Microscopical: Fat; leptothrix; epithelial cells; bacilli morphologically identical with the Boas-Oppler; many streptococci; staphylococci present in small numbers.

August 5: *Stomach contents examined:* Total, 3 ounces, poorly digested, normal odor, blood present. Total acidity, 25; free acid, 0; combined acid, 0; lactic acid, 0. Microscopical: Fat and bacilli as above.

August 6: *Liver aspiration negative.*

August 13: Salol, gr. x., administered at 1:20 P.M. No salicylic acid reaction in the urine at 3 and 4:30 P.M.

August 16: Some dulness and bronchial breathing over the upper lobe of the left lung.

August 18: *Blood examination:* Hemoglobin, 13 per cent.; white blood cells, 10,600; red blood cells, 1,836,000. The patient is rapidly emaciating; anemia very marked. Tenderness over the sternum markedly increased. No change in the size of the liver.

August 19: *Examination of stool* after the administration of oleoresin of felix mass: No parasites or eggs found; many triple phosphate crystals and meat fibres found.

August 21: General condition deteriorating; the anemia is increasing. Liver percussion: Upper border, mammary line, fifth space; lower border, 3 fingers below. Upper border, axillary line, sixth space; lower border, 2 fingers below.

August 23: *Blood count:* Hemoglobin, 13 per cent.; red blood cells, 1,825,000; white blood cells, 18,400.

September 1: General condition very poor. No change in size of liver. No increase in pain. Hemoglobin, 10 per cent.; red cells, 1,875,000; white cells, 11,400.

Temperature: Ranged between 98.6° and 101.6°. Higher in the evening, lower in the morning.

Urine: The usual report was as follows: Color, clear yellow, no sediment; reaction, acid; specific gravity, 1010; albumin, faint trace; urea, 1.5 per cent.; sugar, negative; bile, negative; indican, trace; microscopically, negative.

Autopsy.—Body very markedly emaciated; mucous membranes very anemic. No rigor mortis, no icterus.

Lungs: Right, adhesion at apex. Both emphysematous at upper lobes. Lower lobes congested. Moderate edema. Malformation of left lung, there being a fairly distinct middle lobe in connection with the upper lobe. Bronchial nodes slightly enlarged, anthracotic. No evident tuberculosis. Pulmonary vessels negative.

Heart: Much clear fluid in the pericardium. Serous atrophy of the fat. Brown atrophy of the heart. Right auricle dilated. Edges of tricuspid and mitral orifices thickened, white in color. Aortic valves, aorta, and coronaries negative.

Stomach: Normal in size. Adherent to surrounding viscera, extending over half the length of the viscus. Beginning at the cardia is a growth involving the anterior and posterior walls. It extends through the peritoneum externally. It is white in color and very hard. Internally it presents a very large, eroded, ulcerated infiltration, yellow in color on the surface, white in the depths; the surface is very irregular and soft. Over the remainder of the stomach there are nodules under the mucosa, some of which approach the pylorus. Those portions of the stomach wall which are not infiltrated are swollen and hemorrhagic. At about the middle of the greater curvature is a large opening into the transverse colon; it is about 2.5 cm. in diameter; its edge consists of irregular friable masses; infiltrations are present in the walls of the colon nearby. The original growth shows some purulent areas in its depths. In stomach and colon there is present some yellowish-gray, grumous material with a foul, acid odor. The lymph nodes in the neighborhood are infiltrated; some are very large. Some show yellowish, soft areas on section; the rest are white, firm, and soft grayish material can be scraped off. A few show a hard, white, central nodule. The intestines, excluding the colon, were not opened; no evidence of growth anywhere.

Spleen: Enlarged, flabby, pale; supernumerary splenule. On section, hemorrhagic areas; pulp easily scraped off.

Liver: Weight, 1 3-5 kilogrammes. Dark brown in color. Chronic congestion. Markings very cloudy. In right lobe a metastatic, typical, scirrhous carcinoma with small, pale, translucent areas; growth about 8 cm. in diameter. Small foci nearby. Gall bladder negative.

A point of interest in this case is, first of all, the age at which this disease occurred in this patient. It is exceptional to find a case of cancer of the stomach in a man under 28 years of age. In the absence of a tumor which can be plainly felt, and in the absence of positive symptoms obtained from an examination of the stomach contents, and with only occasional slight pain in the epigastric region, the fact that the patient was under 30 years of age would generally exclude cancer

DEATHS FROM CANCER OF THE STOMACH AND LIVER, BOROUGH OF MANHATTAN (WITH PERCENTAGES OF DEATHS FROM ABOVE UPON DEATHS FROM ALL CAUSES).

YEAR 1901.

Ages.....	0	1	2	3	4	Under 5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	Total.
Deaths from cancer of stomach and liver.....	..	..	..	..	..	..	..	1	1	4	5	16	29	55	57	83	90	53	61	49	23	9	3	539
Deaths from all causes.....	8,529	2,720	1,043	666	499	13,457	1,008	456	732	1,732	1,982	2,220	2,363	2,175	1,907	2,105	1,888	1,958	1,596	1,363	922	592	362	38,507
Percentage.....	..	..	..	..	..	..	..	0.22	0.14	0.28	0.25	0.72	1.23	2.53	2.99	3.94	4.77	2.71	3.82	3.59	2.49	1.52	0.83	1.40

YEAR 1902.

Ages	0	1	2	3	4	Under 5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	Total.
Deaths from cancer of stomach and liver.....	..	..	..	..	..	..	1	..	1	2	6	9	28	42	54	90	76	90	48	38	20	7	4	516
Deaths from all causes.....	8,594	2,683	1,111	597	436	13,421	1,013	472	727	1,818	1,745	2,046	2,175	2,085	1,808	1,940	1,781	1,825	1,462	1,207	873	512	358	36,769
Percentage.....	..	..	..	..	..	..	0.10	..	0.14	0.15	0.34	0.44	1.29	2.01	2.99	4.64	4.27	4.93	3.28	3.15	2.29	1.37	1.12	1.40

of the stomach; yet cases of cancer of the stomach do occur even in younger subjects than this one.

Through the courtesy of Dr. William H. Guilfoy, Registrar of Vital Statistics of the city of New York, I have been able to obtain the statistics on page 62 showing the frequency with which cancer of the stomach and liver occurred as a cause of death in the Borough of Manhattan during the years 1901 and 1902.

From tables such as these it is evident that only comparative and not absolute statistics can be arrived at. For, in the first place, there is no attempt to differentiate the types of tumor from which the cases have died. Lymphosarcoma and carcinoma would be treated alike in such statistics as these. The cases reported under 10 years of age, if malignant tumors, were probably lymphosarcoma. It must not be forgotten, too, that the diagnosis in mortality statistics rests upon the results of the observation and judgment of individual practitioners. These vary in skill, acumen, and knowledge. It has been found in the London hospital that only 55 per cent. of all cases that are sent in with diagnosis of cancer of stomach prove to have such a disease.[1] These facts, however, do not very much lessen the value of mortality statistics from a comparative standpoint, and the comparative frequency of cancer at different ages can thus be instructively studied. It is thus seen that in the two years 25 cases died of cancer of the stomach and liver, out of a total of 1,055 deaths from this condition, between the ages of 25 and 30 years, or about 2⅓ per cent.; also, that but .58 per cent. of the *total deaths* from all causes at that age were from cancer of the stomach and liver. These diseases were the cause of death in 4½ per cent. of all persons dying at the age of 55 years. Indeed, the maximum frequency of death from cancer of the liver and stomach, from these tables, would appear to be between the ages of 55 and 60 years.

It is of considerable interest to us that in this case, notwithstanding the absence of symptoms which some years ago were considered *sine qua non* for a diagnosis of malignant neoplasm of the stomach—namely, the presence of a palpable tumor and coffee-ground vomiting—yet an almost positive recognition of malignant disease of the stomach could be arrived at from symptoms depending for their recognition upon an examination of the blood and an examination of the stomach contents during digestion. Both of these sources of

[1]Fenwick: Cancer and Other Tumors of the Stomach, London, 1902, p. 78.

information have added much to the possibility of early diagnosis of cancer of the stomach.

This patient on his entrance to the hospital complained chiefly of weakness. His anemia was so marked that the blood was examined immediately after my first visit, and showed a greatly diminished percentage of hemoglobin; leucocytes, 11,000, chiefly polymorphonuclear neutrophiles; large diminution in the number of red cells, which were very pale, with a moderate number of megaloblasts, normoblasts, megalocytes, and poikilocytes. Later blood examinations (August 18) showed hemoglobin reduced to 13 per cent., white blood cells 10,600, red blood cells 1,836,000.

August 23: Hemoglobin, 13 per cent.; red blood cells, 1,825,000; white blood cells, 18,400.

September 1: Hemoglobin reduced to 10 per cent.

All of these blood examinations give, then, the picture of progressive secondary anemia resembling pernicious anemia. In this case the diagnosis of malignant disease of the stomach and liver made on the first examination did not depend to any great extent upon the blood changes, except that these latter emphasized the results arrived at from other clinical data; yet so positive a series of changes as the blood changes observed in the anemia present in carcinoma of the stomach, has great importance in the differential diagnosis of suspicious cases and should add much to the possibility of diagnosis sufficiently early for the successful surgical treatment of these cases. To differentiate such secondary anemias from pernicious anemia *per se*, Henry[2] lays much stress upon the observation that in carcinoma of the stomach the red blood cell count is never below 1,500,000, while in pernicious anemia it is never above 1,000,000. In ulcer of the stomach with hemorrhages and resulting secondary anemia it has been claimed that the diminution in the percentage of hemoglobin and in the red blood count is most marked immediately after a hemorrhage, but improvement soon sets in, while in carcinoma of the stomach the percentage of hemoglobin, as well as the red blood count, continuously and persistently diminishes. These retrograde changes in the character of the blood are interrupted only by surgical removal of the cancerous growth in early cases. Where a leucocytosis is present in cancer of the stomach it has been held by various observers that an increase in the leucocyte count is accompanied by a steady and considerable dim-

[2]Archiv f. Verdauungskrankheiten, Band iv., Heft 1.

inution of the red blood count. This is not the case in other forms of secondary anemia, and serves to differentiate these forms of anemia from pernicious anemia. Strauss and Rohnstein[3] call attention to the diminution in the lymphocytes in the blood in patients suffering from cancer. The frequent absence, in cancer of the stomach, of the temporary leucocytosis occurring during and after digestion is characteristic also of the posthemorrhagic anemia present in ulcer of the stomach, and even in the anemia of patients suffering from gastric catarrh.[4]

The pigmentation present frequently in progressive anemia and secondary anemia, due to the iron set free by the disorganization of the red blood globules, was noted in the clinical history of the case.

While many of these blood changes are due to the absorption into the circulation of the toxic materials produced under the influence of the cancerous growth and are a measure of the toxemia, the general marasmus and loss in weight are not the direct result of the changes in the blood, as is shown by the fact that many cases of advanced general cachexia in cancer show the blood changes only to a limited extent, while other patients show advanced blood changes, of the type described, early and before the general nutrition has suffered.

This patient complained on admission of pain over the epigastrium, increased after eating and very severe at night. The stomach contents during digestion of a test meal were therefore examined, with the result shown in the history. There was greatly diminished total acidity, absence of free hydrochloric acid, and absence of lactic acid.

While the first two of these three conditions are present in most cases of cancer of the stomach, the only one of the three that is invariably present is the diminished total acidity. This condition, however, is so frequently present in various primary diseases of the stomach, and in various pathological states of the stomach secondary to other constitutional diseases, that it alone has no diagnostic importance. Diminution in the total acidity of gastric contents is present in most cases of chronic catarrhal and atrophic gastritis; in the gastric catarrh of chronic jaundice, severe anemias, neurasthenia, melancholia and other forms of insanity; in cancer, tuberculosis, and other cachectic conditions; in valvular heart disease; in chronic nephritis, and also after long-continued use of saline cathartics and alkaline mineral salts. The absence of free hydrochloric acid, however, is a far more dis-

[3]Blutzusammensetzung bei d. versch. Anaemien, 1901.

[4]V. Jez: Wien. med. Wochenschrift, 1898, Nos. 14 and 15.

tinctive symptom, but is frequently seen in the febrile and especially the infectious diseases, in atrophic gastritis, in pernicious anemia, as well as in carcinoma of the stomach. Fenwick[3] found that out of 495 cases of gastric carcinoma, free hydrochloric acid was absent in 89 per cent. and present in small quantities in 9.7 per cent., while in 1.3 per cent. it existed in excess. This absence of free acid is due to the secondary chronic gastritis, with disappearance of the parietal cells, which accompanies cancer of the stomach, and more especially cancer of the pylorus. When the cancer is thus located the food is apt to be retained and undergoes decomposition and fermentation, causing a chronic gastritis progressing in some cases to atrophy of the secreting glands.

In the small percentage of cases in which free acid is present with gastric cancer the growth, although usually small, is generally located in the anterior or posterior wall, with only slight dilatation of the stomach. In the very small percentage of cases in which gastric cancer is accompanied by an excess of free acid, it is possible that the cancer is a cancerous degeneration of a simple gastric ulcer; the hyperacidity characterizing the latter condition persisting until the occurrence of the general secondary gastritis which results from the cancerous growth.

The presence of appreciable amounts of lactic acid in cancer of the stomach is not as frequently observed as the absence, or at least diminution, of free acids; nevertheless most of the observers, following Boas, have found lactic acid present in a very large proportion—indeed, in 90 per cent. of cases of cancer of the stomach. This condition is the result partly of the absence of free hydrochloric acid, combined with gastric motor insufficiency, with resulting fermentation in the stomach contents and dilatation of the organ. These conditions are especially fulfilled in pyloric stenosis of a cancerous type, and even in cancers of the walls of the stomach conditions favoring fermentation and absence of acidity are present.

When the patient was admitted into the hospital he stated that the symptoms from which he was suffering, such as anemia, loss in weight, dyspepsia, etc., had only been present two weeks. He died after one month of treatment, so that the history would give only a duration of six weeks to the disease in this case. It is probable, however, that the duration was somewhat longer, the patient being one of a class that is

[3]Op. cit.

not very introspective and not apt to complain of illness until the symptoms are very burdensome. Nevertheless it is the rule in carcinoma of the stomach occurring in early life, under 30 years of age, for the disease to run a rapid course,[6] the average duration of such cases being about three months.

Furthermore, it is found by most authorities that cancer of the walls and curvatures of the stomach proves more rapidly fatal than that at any other site, except cancer of the cardiac extremity of the stomach, especially with esophageal obstruction; the latter are naturally most rapidly fatal of all, starvation adding its quota to the horrors of the disease. It is found that in cancers of the stomach that grow rapidly there is secondary involvement of the liver and peritoneum far more frequently than in cancers of slower growth. The autopsy showed that these conditions were all present in our patient.

At autopsy a large perforation between the greater curvature and transverse colon was found. This perforation was about 2½ cm. in diameter; the surrounding portions of the wall of the stomach and colon were densely adherent and infiltrated, and the opening formed a direct communication between the stomach and colon. Cancerous perforation of the coats of the stomach in cancer is not rare. It occurs frequently. The symptoms and results of such a perforation will differ under various circumstances. Thus, when perforation of the coats of the stomach occurs before adhesions have been contracted between the stomach and the surrounding structures at the site of perforation, the symptoms of acute general peritonitis, due to invasion of the peritoneal cavity by the foreign and septic material, will ensue. This is a rare occurrence in cancer, while far more frequent in perforations of simple ulcers of the stomach. If surrounding adhesions limit the diffusion of the materials poured out through the perforation, an abscess will develop, which in turn may perforate into the hollow or solid viscera. If adhesion and extension of the primary growth closely unite the walls of the stomach with the liver, a perforation will simply result in the formation of an abscess. If such adhesions closely unite the coats of the stomach with the coats of the colon, as in this case, previous to the occurrence of the rupture, the symptoms are ordinarily indicative of such an occurrence. Thus, in cases in which the patient has suffered from considerable vomiting previous to the rupture, the vomiting will suddenly cease, and here will ensue lienteric

[6] M. Mathieu: Du Cancer précoce de l'Estomac. Thèse de Lyon, 1884.

diarrhœa with the appearance of undigested food masses in the stools. This was a symptom in our patient, undigested meat fibres being found in the stools on several occasions, although this patient did not suffer from diarrhœa. Occasionally, on the other hand, such rupture is found to be followed by fecal vomiting, due to the regurgitation of fecal masses from the colon into the stomach. In all cases the patient's breath has a fecal odor. The cachexia and emaciation progress much more rapidly after such perforation has occurred, and the fatal termination is rarely delayed for more than two or three weeks.

Perforation into the small intestine is rather a rare occurrence, although cancer of the pylorus sometimes results in a perforation abscess, which in turn ruptures into the second portion of the duodenum, forming a gastrointestinal fistula. This also is much less frequently seen than a gastrocolic fistula.

The pathological report of this case as to the type of cancerous growth present presents nothing of exceptional interest. The gross appearance was that of the soft, spheroidal-cell, encephaloid carcinoma, with the hard indurated base which is not infrequent in soft cancers, especially at the site at which the primary lesion in this case was located.

It was an interesting factor in this case that the hemorrhages which occur especially early in the course of cases of this form of cancer were not present. This is probably accounted for by the fact that the early occurrence of perforation prevented the accumulation of food contents in the stomach, and the vomiting which accompanies it, thus sparing the patient the straining which frequently initiates an attack of hematemesis.

While the patient was under observation there was no sign of blood in the stools, and he gave no history of such an occurrence before admission to the hospital.

STATISTICAL REPORT—CHILDREN'S SERVICE.

1901.

HENRY KOPLIK, M.D.,

ATTENDING PHYSICIAN.

Respiratory System.	M	F
Bronchitis, acute	1	..
Bronchiectasis	3	..
Empyema, metapneumonic	27	14
" and erysipelas	1	..
" " scarlatina	..	1
Lung, gangrene of	1	..
Pleurisy with effusion	1	..
Pneumonia, lobar	7	8
" " and diphtheria	1	..
" broncho	50	30
" " and diphtheria	1	1
" " " scarlatina	..	1
" " " endocarditis	2	..
Pneumonia, broncho, and meningitis	..	1
Pneumonia, resolving	..	1
Tuberculosis, pulmonary	1	..
	96	57

Circulatory System.		
Endocarditis, acute	1	..
" chronic	15	9
" " and cerebral embolism	..	1
Endocarditis, chronic; pericardial effusion; chorea	1	..
Endocarditis, chronic; pleurisy with effusion; pericarditis	1	..
Endocarditis, chronic, and pericarditis	..	1
Endocarditis, malignant	..	1
Heart, congenital valvular lesion, and pneumonia	..	1
	18	13

Gastroenteric Tract.		
Dysentery, acute	1	1
Constipation	1	..
Enterocolitis, acute	2	6
Dyspepsia, acute	..	1
" chronic	2	..
Gastroenteritis	7	6
" and bronchopneumonia	3	4
Intestinal autointoxication	3	2
	19	20

Nervous System.	M	F
Amaurotic family idiocy	..	1
Chorea	7	8
Epilepsy and imbecility	1	..
Hysteria	..	1
Hemorrhage, intracranial	..	1
Paralysis, pseudohypertrophic	1	..
" postdiphtheritic	1	..
Poliomyelitis anterior	..	1
	10	12

Genitourinary and Kidneys.		
Nephritis, acute	2	2
" " and bronchopneumonia	1	1
Nephritis, chronic	4	1
" " and bronchopneumonia	1	..
Movable kidney	..	1
Vulvovaginitis	..	1
	8	6

Specific Infectious Diseases.		
Actinomycosis	..	1
Influenza	..	1
Jaundice, acute catarrhal	..	1
Measles	..	1
Meningitis, cerebrospinal	4	1
" tubercular	6	6
Peritonitis, tubercular	1	..
Pertussis	..	1
Rötheln	1	1
Scarlatina	2	2
Typhoid fever	10	16
" " and lobar pneumonia	..	2
Tuberculosis, acute general miliary	2	..
	26	33

Constitutional Diseases		
Peliosis rheumatica	1	..
Rheumatism, subacute articular	1	..
Rachitis	1	1
Lymphatism	1	..
Syphilis	1	1
	5	2

Cutaneous Diseases.	M	F
Scleroderma		1
Eczema, chronic		1
		2
Unclassified Diseases.		
Abdomen, tumor of		1
Adenitis, inguinal		1
Adenoids		1
Anemia infantum pseudoleukemica		1
Burns	1	1

Unclassified Diseases.—*Cont'd*	M	F
Cephalalgia	1	
Ecchymosis of face		1
Enuresis	1	
Laryngismus stridulus		1
Mastoiditis		1
Sclerema	1	
Purpura hemorrhagica and sclerema		1
Scorbutus	1	
	5	9

Total, 340. Males, 186; Females, 154.

EMPYEMA—OPERATIVE REPORT.

Cases admitted	41	Cases unoperated	1
" operated	39	" died	7
" " before admission	1	" " in hospital after operations	5

Death rate following operation in hospital, 12+ per cent.

DEATHS.

Actinomycosis	1	Nephritis, acute, and bronchopneumonia	2
Amaurotic family idiocy	1	Nephritis, chronic	2
Anemia infantum pseudoleukemica	1	Pneumonia, broncho	21
Acute general miliary tuberculosis	2	" " and diphtheria	1
Burns	1	" " " meningitis	1
Acute dysentery	1	" lobar	1
Empyema	7	" " and nasal diphtheria	1
" and erysipelas	1	Pertussis and bronchopneumonia	1
Endocarditis, chronic	4	Purpura hemorrhagica	1
" malignant	1	Meningitis, cerebrospinal	4
Enterocolitis	4	" tubercular	11
Hemorrhage, intracranial	1	Sclerema	1
Gastroenteritis	3	Syphilis	1
" " and bronchopneumonia	6	Typhoid fever	4
Lung, gangrene of	1	" and lobar pneumonia	2
Lymphatism	1		90

Number of patients dying within 24 hours after admission, 22

STATISTICAL REPORT—CHILDREN'S SERVICE.

1902.

HENRY KOPLIK, M.D.,

ATTENDING PHYSICIAN.

	Male.				Female.				
Respiratory System.	Cured.	Improved.	Unimproved.	Died.	Cured.	Improved.	Unimproved.	Died.	Total.
Bronchitis, subacute			1		1				2
Empyema	9	5			11			1	26
" bilateral					2			1	3
" enteritis		1							1
" measles; bronchopneumonia	1			1					2
" pertussis					1				1
" rötheln					1				1
" scarlet fever	1			2		1		3	7
Lung, tuberculosis of						1			1
" neoplasm of				1					1
Pleurisy with effusion	3	1							4
Pneumonia, broncho	7			3	3	1		6	20
" " septic arthritis		1							1
" " empyema				2					2
" " hemorrhagic pleurisy								1	1
" " hydrocephalus		1							1
" " mastoid bilateral	1			1					2
" " measles	4		1		3				8
" " meningitis				1					1
" lobar	11				5				16
" " pertussis	1				1				2
" " scarlet fever	1								1
" " gonorrheal proctitis					1				1
" resolvens	3				1				4
	42	9	2	11	30	3		12	109
Circulatory System.									
Endocarditis, septic								2	2
" acute								1	1
" " pericarditis		1							1
" " lobar pneumonia			1						1
" chronic		7		1		8		1	17
" " pericarditis				1				2	3
" " pneumonia								1	1

	Male.				Female.				
	Cured.	Improved.	Unimproved.	Died.	Cured.	Improved.	Unimproved.	Died.	Total.
Circulatory System—*Continued.*									
Endocarditis, chronic; bronchopneumonia; measles				1					1
" " acute articular rheumatism		1				1			2
" " röthelu						1			1
" " acute follicular tonsillitis						2			2
" congenital			1						1
" subacute; dacryocystitis	1								1
Myocarditis		1							1
	1	10	2	3		12		7	35
Diseases of the Blood.									
Anemia, simple					1				1
" infantum pseudoleukemica		2				1			3
Leukemia, acute		1		1				1	3
		3		1	1	1		1	7
Gastroenteric Tract.									
Colitis, acute; nephritis								1	1
Diarrhea (simple)	1								1
Enteric catarrh	2					1			3
Enterocolitis, acute					1				1
Gastroenteritis				1					1
Stomatitis, ulcerative	1								1
	4			1	1	1		1	8
Nervous System.									
Cerebellum, tumor of			1						1
Chorea	2	1			5	1			9
Hydrocephalus, chronic								1	1
Hysteria					1				1
Pachymeningitis, syphilitic	1								1
Palsy, infantile cerebral		2							2
" " " pertussis		1							1
Habit movements	1								1
Subdural hemorrhage	1								1
	5	4	1		6	1		1	18
Kidneys and Genitourinary System.									
Nephritis, acute				1					1
" " pneumonia	1				1				2
" chronic		4		1		1		1	7
" " (postscarlatinal); pneumonia								1	1
" " peliosis rheumatica						1			1
" subacute		2				1			3
Proctitis, acute gonorrheal		1							1
Pyelonephrosis, double; bronchopneumonia							1		1
	1	7		2	1	3	1	2	17

	Male.				Female.				
	Cured.	Improved.	Unimproved.	Died.	Cured.	Improved.	Unimproved.	Died.	Total.
Cutaneous Diseases.									
Dermatitis exfoliativa					1				1
Lupus vulgaris						1			1
Pemphigus neonatorum								1	1
					1	1		1	3
Infectious Diseases.									
ACUTE AND CHRONIC.									
Diphtheria	1								1
Erysipelas	1				4				5
Influenza					1				1
Malarial fever					1				1
Measles	1								1
Meningitis, epidemic cerebrospinal	1				2			1	4
" tubercular				4			1	8	13
Peritonitis, tubercular		2			1				3
Pertussis; rachitis		1							1
" subacute bronchitis						1			1
Pott's disease of spine			2						2
Rötheln					1				1
Sepsis neonatorum				1					1
Tuberculosis, acute general miliary				1					1
Typhoid fever	13	1			10				24
" " multiple abscesses; otitis media	1								1
" " catalepsy	1								1
" " measles; gonorrheal urethritis	1								1
	20	4	2	6	20	1	1	9	63
Constitutional Diseases.									
Infantile atrophy; diarrhea		3							3
Lymphatism; acute follicular tonsillitis						1			1
" rachitis	2								2
Rachitis; anemia		2				1			3
Rheumatism, acute articular	1								1
	3	5				2			10
Unclassified Diseases.									
Abscess, retropharyngeal					1				1
Appendicitis, acute catarrhal	1								1
Iritis						1			1
Larynx, paralysis of cords of	1								1
Liver, cirrhosis of		1							1
Otitis media, acute					1				1
Stridor, congenital, of larynx		1							1
	2	2			2	1			7

Causes of Death.	Totals.	Male	Female.
Colitis, acute: nephritis	1	1	..
Empyema	2	..	2
" measles: bronchopneumonia	1	1	..
" scarlet fever	5	2	3
Endocarditis, chronic	1	..	1
" septic	2	..	2
" chronic	2	1	1
" " pericarditis	3	1	2
" " pneumonia	1	..	1
" " bronchopneumonia: measles	1	1	..
Gastroenteritis	1	..	1
Hydrocephalus	1	..	1
Leukemia, acute	2	1	1
Lung, neoplasm of	1	1	..
Meningitis, epidemic cerebrospinal	1	1	..
" tubercular	12	4	8
Nephritis, acute	1	1	..
" chronic	2	1	1
" postscarlatinal: pneumonia	1	..	1
Pemphigus neonatorum	1	..	1
Pneumonia, broncho	9	3	6
" " empyema	2	2	..
" " hemorrhagic pleurisy	1	..	1
" " bilateral mastoid (op.)	1	1	..
" " meningitis	1	1	..
Sepsis neonatorum	1	1	..
Tuberculosis, acute general miliary	1	1	..
Totals	58	25	33

	Cured.	Improved.	Unimproved.	Died.	Totals.
Females..	78	44	7	24	153
Males....	62	26	2	34	124
Totals...	140	70	9	58	277

Total mortality = 20.5 per cent.

TYPHOID FEVER IN A CHILD OF SIX AND ONE-HALF YEARS; INTESTINAL PERFORATION; OPERATION; RECOVERY.

By Henry Heiman, M.D.,

ADJUNCT ATTENDING PHYSICIAN, CHILDREN'S SERVICE.

AND

Charles A. Elsberg, M.D.,

ADJUNCT ATTENDING SURGEON.

MEDICAL HISTORY BY DR. HEIMAN.

Becky H., 6½ years of age, was admitted to my service in the ward of Dr. Koplik on July 26, 1902. The father stated that the child had been sick for thirteen days with fever, vomiting, and headache. For several days she had had diarrhea.

Physical examination on admission revealed the following: General condition, fair; heart and lungs, negative; liver and spleen, just palpable; abdomen slightly tympanitic. Leucocytes, 16,400; differential count, 78 polynuclears and 22 mononuclears to the hundred. Widal reaction positive in dilution of 1:50. Urine: Specific gravity 1016, trace of albumin, urea 2.4 per cent., marked diazo reaction, microscopically a few red and white cells. Temperature 105° F., pulse 146, respiration 42.

During the first week of our observation the temperature fluctuated between 102° and 106°, during the second week between 100.8° and 105.2°. The case ran the course of an attack of typhoid fever of a fair degree of severity. On August 4, the twenty-third day of the disease, the stool contained some blood; leucocytes, 3,800. On the following day there was some dulness over the bases of both lungs behind, with numerous subcrepitant râles. On August 6 a large furuncle which had developed over the left mastoid region was incised.

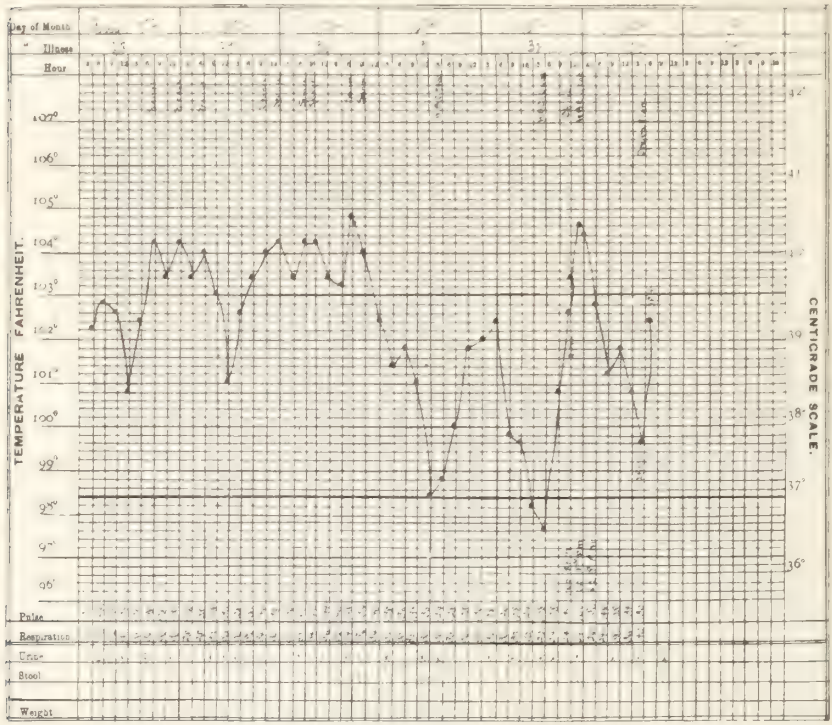
August 8: Profuse discharge of pus from both ears; no tenderness over mastoid regions.

August 9: Temperature 100.8°-104.2°, pulse 120-130, respiration 30-32. See temperature chart of the following week on page 76.

August 12: The temperature has dropped in the past twelve hours from 104° to 98.4°, the pulse from 154 to 130. Leucocytes, 7,400.

Profuse discharge from ears persists. No abdominal symptoms; bowels have moved. General condition about the same.

August 13, 6 A.M.: Temperature 102.4°, pulse 128, respiration 32. 9 A.M., temperature 99.8°, pulse 128; no change in symptoms. 3 P.M., temperature 97.6°, pulse 108; several fluid blood-tinged stools; five small furuncles on scalp incised; leucocytes, 16,600. 9 P.M., severe chill. 1 A.M., temperature 104.6°, pulse 160; abdomen slightly tender but not distended; no vomiting; area of liver dulness not diminished; leucocytes, 11,000.



August 14, 9 A.M.: Temperature 101.2°, pulse 148; child complains for the first time of pain in the abdomen; she lies in bed with the thighs flexed; abdomen slightly more distended and slightly tender all over. Lower border of liver dulness somewhat obliterated by the tympanites. 2 P.M.: The temperature has dropped to 99.6° and the pulse to 134. The child's general condition has become decidedly worse; the pulse is of poor quality and the face has an anxious expression. 3 P.M.: The patient has just vomited; temperature 102.4°, pulse 140; leucocytes, 18,000. The abdomen is more distended and generally tender; there is now well-marked rigidity of the abdominal muscles. The diagnosis of perforation seems certain.

Remarks.—The signs and symptoms which pointed to an intestinal perforation were the following: the sudden fall in the temperature, soon followed by a rise; the progressive rise in the pulse rate; the sudden appearance of abdominal pain; the increasing distension of the abdomen; the general abdominal tenderness; the increasing rigidity of the abdominal muscles; the increase in the number of leucocytes in the blood from 7,400 to 18,000; the sudden appearance of vomiting.

It is known that perforation of the bowel in typhoid fever is more liable to occur with diarrhea, intestinal hemorrhages, and tympanites—in other words, where there are other evidences of deep ulceration of the bowel. It is important to differentiate between the symptoms of perforation and those of other conditions. Thus a marked anemia occurring at the height of the disease may cause all the symptoms of sudden, extreme collapse. The symptoms of peritonitis may be present when there is no perforation. Peritonitis may be due to rupture of a suppurating mesenteric gland, or to rupture of the spleen, or to affection of the gall bladder, as well as to perforation of the intestine.

It is undoubtedly true, also, that some cases of perforation may recover without operation, as a result of the opening in the bowel becoming closed by plastic exudation with circumscription of the peritonitis. One lesson which the case here reported teaches is that in the third week of typhoid fever both physician and nurse should keep a most careful lookout for any change in the symptoms, especially in the presence of marked tympanites, intestinal hemorrhage, or diarrhea.

In conclusion, I wish to thank Dr. Gershel, House Physician, for his faithful observation and prompt reports of the case to me

SURGICAL NOTES BY DR. ELSBERG.

The patient was seen by me in consultation with Dr. Heiman at 4 P.M. The child was lying in bed with its lower extremities flexed and with a pinched look upon its face; temperature 104.4°, pulse 160, respiration 40. The abdomen was slightly distended and quite rigid; there was general abdominal tenderness, most marked on the right side. The other physical signs were those that have already been mentioned above. The diagnosis of perforation of the intestine was concurred in and immediate operation advised. The patient was at once transferred to the surgical service of Dr. Lilienthal.

5:30 P.M., chloroform anesthesia; incision three inches long along the outer border of the right rectus muscle. Opening of the peritoneum was followed by the escape of a little gas and a large quantity of cloudy, inodorous fluid. The loops of small intestine which pre-

sented were injected and much distended. The ileocecal junction was brought into view and the small bowel examined above it. About eight inches above the origin of the cecum there was a perforation of the bowel of the size of a pinhead, from which thin, yellow, fecal matter was escaping. The opening was closed by a double layer of Lembert sutures passed in the long axis of the bowel; the general peritoneal cavity, and especially the pelvis, were sponged as dry as possible, and the abdomen partially closed with through-and-through sutures of silkworm gut with drainage. Duration of operation, eleven minutes.

During the operation the pulse had remained of good quality, but was extremely rapid—200 beats to the minute. Within two hours the pulse dropped to 180.

August 15: Temperature 100.4° to 104.4°, pulse 160-148, respiration 40-28. General condition poor; delirium; small quantity of gas expelled after enema; patient vomited twice after small quantities of fluid nourishment.

August 16: Temperature 99.6°-102.6°, pulse 148-138, respiration 30-28. No vomiting; pulse improved in quality.

August 17: Large furuncle on left hand incised; no vomiting; good movement of bowels after enema; abdomen soft and hardly tender; fluid nourishment taken well.

August 19: Profuse discharge of pus, containing staphylococcus aureus, from both ears; scalp shaved and numerous abscesses on scalp opened; abdominal wound has healed by primary union, except for drainage opening; drain and some of the sutures removed. Leucocytes, 9,000.

August 27: For the past week the temperature has fluctuated between 98° and 102.6°, the pulse between 110 and 130, respiration between 26 and 30. All abdominal symptoms have disappeared; the abdomen is soft and nowhere tender; the bowels have moved regularly; large quantities of fluid nourishment are well taken. On the 21st several new abscesses on scalp and on the 27th a large abscess in the left axilla were opened. The pus from the various abscesses contained staphylococcus aureus in almost pure culture.

August 29: General condition good; temperature, pulse, and respiration practically normal; leucocytes, 9,000; profuse vaginal discharge containing the bacillus typhosus in pure culture (Dr. Bernstein); discharge from ears has ceased; child has gained much flesh and strength.

September 2: Temperature 98.4°-100.2°, pulse 106-120, respiration 22-28. Vaginal discharge has ceased entirely; abdominal wound firmly healed. The patient was retransferred to the children's service on September 2 and was discharged from the hospital two weeks later.

Remarks.—This case presents a few special features of interest. The occurrence of a chill before the symptoms of perforation is unusual. The appearance of a vaginal discharge containing the typhoid

bacillus in pure culture is very rare. It was probably due to infection from the rectum.

Medical literature contains the records of 25 patients under 15 years of age operated upon for perforation of the intestine in the course of typhoid fever, with 16 recoveries—a mortality of only 36 per cent. The case above reported is that of the youngest child on record ever operated upon for this condition. The writer has been able to collect 264 operations for typhoid perforation in adults, with a mortality of 77.6 per cent. The prognosis in children is therefore more than twice as good as in adults. A detailed study of the 25 cases will be published elsewhere; a few facts will be mentioned here.

Among the 25 recorded cases, perforation occurred during the first week in no case, during the second week in 2 cases, during the third week in 10 cases, during the fourth week in 2 cases, during the fifth week in 3 cases, during the sixth week in 3 cases, during a relapse in 4 cases, in one case the week of the disease was unknown.

The operation was performed during the first four hours in 2 cases, 2 recoveries—100 per cent. recoveries; during the second four hours in 3 cases, 2 recoveries—66.6 per cent. recoveries; during the third four hours in 7 cases, 5 recoveries—71.4 per cent. recoveries; during the fourth four hours in 3 cases, 3 recoveries—100 per cent. recoveries; during the fifth four hours in 1 case, no recoveries—no per cent. recoveries; during the sixth four hours in 1 case, no recoveries—no per cent. recoveries; later in 7 cases, 4 recoveries—57 per cent. recoveries; time unknown in 1 case, no recoveries—no per cent. recoveries.

The above enumeration shows that the chances of recovery in children are very good. The two patients operated upon during the first four hours after the first symptoms of perforation, recovered. Of the three patients operated on during the second four hours, one died, and that one died one week after the operation, not from the surgical interference, but from typhoid toxemia after all of the abdominal signs had disappeared. If this case be considered an operative recovery, then all of the cases operated upon during the first eight hours recovered; and of 15 patients operated on during the first sixteen hours, 13, or 86.6 per cent, recovered. Of 8 patients operated upon after the first sixteen hours had elapsed, only 4, or 44.4 per cent., recovered, and two of the four were cases in which the inflammatory process had become more or less localized on the right side of the abdominal cavity.

These statistics would seem to show, therefore, that the prognosis in operations for typhoid perforation in children is far better than has been believed heretofore. As good results as the above can surely never be obtained by medical treatment alone or by delay in operative interference until, and with the hope that, the inflammatory process will become localized. We believe that the statistics given above demonstrate the correctness of the statement made by Harvey Cushing concerning operations for typhoid perforation in adults—above all when applied to children—that "a surgical operation is the only rational treatment of perforating typhoid ulcer," and that "there is no contraindication to the operation, surgically speaking, save a moribund condition of the patient."

REPORT OF THE DEPARTMENT OF GENERAL SURGERY FOR 1901.

REPORT OF THE FIRST SURGICAL DIVISION.

ARPAD G. GERSTER, M.D.,
ATTENDING SURGEON.

A. A. BERG, M.D., AND A. V. MOSCHCOWITZ, M.D.,
ADJUNCT SURGEONS.

DISEASES OF THE HEAD. 21 PATIENTS; 17 OPERATIONS; 1 DEATH.

	Total.	Cured.	Improved.	Unimproved.	Died.
Sebaceous cysts of the scalp	1	1	..	..	..
Tubercular osteomyelitis of the skull	1	1	..	..	..
Sarcoma of the pericranium (secondary)	1	..	..	1	..
Microcephalus	1	..	..	1	..
DISEASES OF THE FACE, MOUTH, AND TONGUE.					
Harelip	1	1	..	..	..
Saddlenose	1	1	..	..	..
Defective septum ali nasi	1	1	..	..	..
Diabetic phlegmon of face; coma	1	..	..	..	1
Neuralgia of infraorbital nerve	1	..	..	1	..
" " second branch of fifth nerve	1	..	..	1	..
Cleft soft palate	1	1	..	..	..
Tuberculosis of the tongue	1	1	..	..	..
Eschar of tongue	1	1	..	..	..
Necrosis of enlarged (specific) lingual tonsil	1	1	..	..	..
Epithelial carcinoma of tongue	1	1	..	..	..
" " " cheek and gums	1	1	..	..	..
Peritonsillar abscess	2	2	..	..	..
Retrotonsillar glandular sarcoma	1	1	..	..	..
Osteomyelitis of inferior maxilla	1	1	..	..	..
Recurrent carcinoma of inferior maxilla	1	1	..	..	..
Empyema of antrum Highmoriani	1	1	..	..	..

Operations upon the Head, Face, and Oral Cavity.

	Total.	Cured.	Died.
Removal of sebaceous cysts of the scalp	1	1	..
Sequestrotomy for osteomyelitis of the skull	1	1	..
Incision of extensive diabetic phlegmon of the face; coma	1	..	1
Plastic operation for harelip	1	1	..
Skin transplantation from upper lip for defect in septum all nasi	1	1	..
Staphylorrhaphy	1	1	..
Heteroplasty for saddlenose	1	1	..
Sequestrotomy for osteomyelitis of inferior maxilla	1	1	..
Amputation of tongue (Langenbeck)	1	1	..
Cauterization of tuberculosis of tongue	1	1	..
Resection of alveolar process of inferior maxilla	1	1	..
" " one-half of horizontal ramus of inferior maxilla	1	1	..
Drainage of antrum Highmoriani	1	1	..
Excision of retrotonsillar glandular sarcoma (Langenbeck)	1	1	..
Incision of peritonsillar abscess	2	2	..

METHODS OF REMOVAL OF MALIGNANT NEOPLASMS WITHIN THE ORAL CAVITY.

Malignant neoplasms of the gums, or of the alveolar processes of the maxillary bones, extending no further backward than the canine teeth, are removed, with a wide margin of healthy tissues, through the mouth; similarly malignant growths of small extent occupying the tip of the tongue.

Where the site of the neoplasm is further back, between the anterior faucial pillars and the canine fossa, excellent exposure and access is afforded by splitting the cheek from the angle of the mouth outward in a line drawn to the anterior inferior angle of the masseter muscle.

The submaxillary glands, when involved, are first exposed by an incision in the neck, and the entire glands with their lymphatics dissected out, but left attached to the neoplasm. The cheek is then split, and the neoplasm, with a wide area of healthy tissue, is removed in one piece with the submaxillary glands and lymphatics. The dissection of the glandular structures in the neck before opening the oral cavity and floor of the mouth, does away with the necessity of preliminary tracheotomy. The dependent position of the head (Rose) affords an additional safeguard against the entrance of blood into the air passages. For growths situated behind the anterior faucial pillars the Langenbeck operation is employed. The lower jaw is obliquely divided from above and behind, downward and forward, being drilled for sutures before its division.

Preliminary tracheotomy was practised in two of our cases. In one it was necessitated by threatened suffocation from the falling backward over the superior laryngeal aperture of a large retro-tonsillar sarcoma, as soon as full anesthesia was induced. In the other case, one of complete excision of the tongue, a tracheotomy was deemed advisable, both to facilitate the administration of the anesthetic and to prevent aspiration of blood during what promised to be a necessarily prolonged and bloody operation.

Secondary septic pneumonia following preliminary tracheotomy has not occurred in any of our cases. This has been attributed to the great care that has always been exercised toward securing thorough drainage outward of the discharges that arise at the site of the operation. Where such drainage is not efficiently provided for, the discharges trickle down into the larynx and bronchi, where, from the patient's inability to expel them (the tracheal opening interfering with the act of coughing), they give rise to a septic pneumonia. For securing thorough drainage of the pharynx and site of operation, especially after complete excision of the tongue, Mikulicz has suggested the following procedure: The mucosa of the pharynx at the side of the larynx is united by a few sutures to the skin of the neck at the lower angle of the Langenbeck incision. A pouting mucous-membrane fistula at the lowest angle of the wound is thus established. With the patient lying, with head lowered, upon the affected side, gravity compels the rapid and easy conduction of the secretions of the nose, mouth, pharynx, and wound surfaces, along the smooth, slippery, and oblique canal, to the exterior. Retention in the fossæ and folds between the epiglottis and tongue is thus rendered absolutely impossible. Furthermore, such drainage is more direct and efficient than drainage by tubes and gauze, which are easily kinked and plugged, or irritate the pharynx or larynx and thereby excite cough and increased secretion. This procedure was practised in our case of complete excision of the tongue. The experience gained was so satisfactory, and the entire after-treatment rendered so simple and easy, that its use in other cases of a similar kind will certainly be followed. The fistula is easily closed when its use is no longer required.

Of our three cases of malignant disease, one, the patient with extensive epithelioma of the tongue, suffered a relapse in the cervical glands three months after operation. These glands were removed under local anesthesia. A local relapse rapidly followed, and the patient succumbed to his disease within the year. The patient with

epithelioma of the gums is free from recurrence nine months after operation; the patient with retrotonsillar sarcoma had had no relapse at the time of his last visit, about nine months after operation. The histories of the cases of epithelioma of the tongue and retrotonsillar sarcoma follow.

1901, vol. iv., page 340. *Epithelial Carcinoma of the Tongue and Floor of the Mouth; Complete Extirpation of the Tongue (Langenbeck); Recovery.* M. L., 58 years old, admitted February 17, 1901. His previous and family histories were negative. Six months before, he had noticed a small lump on the right side of the tongue. This had steadily increased in size. He lost 15 to 20 pounds in weight. On admission the tongue was very much enlarged and indurated throughout its entire extent. At the junction of the distal and middle thirds was an ulcer about the size of a twenty-five-cent piece, with necrotic base and everted edges. The malady extended backward to the base of the tongue, to the floor of the mouth and the palatal arches on the right side. There were no glandular enlargements palpable. Preliminary administration of KI effected no appreciable change in the appearance or size of the tumor. Diagnosis: Carcinoma of the tongue.

February 18: Tracheotomy (superior). Complete excision of the tongue (Langenbeck). Chloroform anesthesia. The operation of excision was rendered especially difficult on account of a partial ankylosis of the lower jaw, which prevented a separation of the teeth to a greater distance than one and one-half inches. The base of the tongue had to be secured by three mass ligatures, on account of the absolute inaccessibility of the left lingual artery. The procedure suggested by Mikuliez was followed. The operation lasted three hours; little blood was lost, and the patient was in good condition at its termination.

His reaction from the operation was good. Following the operation his highest temperature was 100.6°, the pulse rate between 80 and 85 per minute.

Excellent drainage was afforded by the mucous fistula in the neck. The mouth and pharynx were daily cleaned of a rather profuse, ropy mucus by irrigation with saline solution, the irrigating fluid being nicely drained away through the cervical mucous fistula. Nutrition was maintained by rectum for the first three days, and thereafter by gavage, the tube being passed through the mouth. On the sixth day he commenced to swallow small quantities of liquid nourishment. Distinct articulation was made on the sixth day. The tracheal canula was removed on the fifth day. Gradual but uninterrupted convalescence. Secondary closure of the mucous fistula on March 11, 1901. On March 30 the stomach tube was discontinued, the patient being able to swallow sufficient nourishment.

April 7: Discharged with slightly discharging sinus corresponding to the section of the ramus of the jaw, where slight crepitus could still be felt on pressure. The faucial aperture asymmetrically dis-

torted to the right side. Speech improving, but still thick. Mastication painful, swallowing good.

1901, vol. iv., page 335. *Retrotonsillar Glandular Sarcoma; Excision by Langenbeck Method; Recovery.*—C. A., 44 years old, a gardener, was admitted March 4, 1901. He had suffered from a number of the infectious diseases of childhood. He never had syphilis. In the beginning of the previous November, coincident with the onset of an attack of typhoid fever, he commenced to have pain in the throat and some difficulty in breathing. The latter symptom becoming more marked, he applied to one of the city hospitals for treatment. There the tonsil was incised and some amelioration of the symptoms followed. The pain in the throat, radiating to the left ear, soon returned, in even greater intensity. The tonsil was again incised and some relief afforded. Improvement was again only temporary, as the pain and difficulty in breathing reappeared. The administration of KI did not influence patient's subjective or objective symptoms.

On admission a hard, fusiform, smooth mass was found occupying the position of the left tonsil and extending upward to the soft and hard palates. The tumor also extended backward on the pharyngeal vault to about opposite the base of the tongue. The uvula was pushed to the right. No glandular involvement. No marked emaciation. The tumor was somewhat painful and tender, and interfered with breathing and deglutition. Diagnosis: Sarcoma of tonsil.

March 8: Excision of tumor by Langenbeck method under chloroform anesthesia. As soon as muscular relaxation from the chloroform was complete, the tumor mass fell backward over the superior laryngeal aperture, blocking the latter and seriously interfering with respiration. Preliminary superior tracheotomy had to be precipitately done, and, with the canula in place, respiration became quiet and deep. The excision was done in typical fashion, following the Langenbeck method. The opening steps of the operation consisted in exposing the glands and large vessels in the neck. A small gland around the external carotid artery was removed, and the carotid deligated. The horizontal ramus was then divided obliquely, and the mucous membrane of the side and floor of the mouth split backward to the tonsil. The tumor, thus clearly and excellently exposed to view, was lifted from its bed, its nutrient vessels secured and ligated, and removed. It proved to be a retrotonsillar glandular tumor which had pushed the tonsil forward but had not invaded it. The mucous membrane of the floor and side of the mouth was united by catgut suture, the ramus of the maxilla united by wire sutures, and the external wound closed, except at its lower angle, where a gauze drain to the retrotonsillar structures emerged. The tracheal canula was removed and the tracheotomy wound packed with gauze.

The post-operative reaction was excellent. A rise of temperature up to 102° occurred in the course of the first week, due to retention behind the gauze drain; it subsided with establishment of free drainage. Nourishment by mouth was permitted after the first twenty-four

hours. Swallowing, though painful, was easy, and sufficient nourishment was taken.

March 17: Considerable tenderness over the line of division of the jaw; no union of the fragments. A small fistula in the floor of the mouth, communicating with the external drain opening, through which some of the fluids that are taken escape.

Tracheal wound gradually closed by granulations. The line of division of the maxillary ramus was infected by the discharges from the oral cavity. A mild type of osteomyelitis resulted, with necrosis and sequestration of the outer lamellæ of the bone. Bony union finally took place. The mucous fistula persisted for some time and necessitated a plastic operation to effect its closure.

August 2: Discharged cured.

Pathological diagnosis: Lymphangiosarcoma of tonsil and gland.

The following fatal case of extensive phlegmonous cellulitis of the face in a diabetic subject is of interest:

1901, vol. iv., page 332. *Phlegmonous Cellulitis of Face in a Diabetic Subject: Extensive Splitting of Cheeks and Lips: Coma: Death.*—D. F., 44 years old, was admitted April 2, 1901. He had suffered from diabetes mellitus for several years. Two weeks previous to his admission he had scratched a small pimple situated at the base of the left nostril. The pimple became inflamed and the inflammation rapidly spread over the entire upper and lower lips, and the left side of the face from the eye above to the jaw below. A small incision had been made into the area of induration on the upper lip four days prior to his admission, some pus being evacuated.

On admission the left side of the face was very much indurated and swollen; the left eye was closed. The skin over the left side of the face was covered with a number of small pustules. There were two small sinuses in the region of the upper lip, from which fetid pus was discharged. Urine contained sugar. Temperature was 103.8°, pulse 128 to the minute.

Immediate operation under local anesthesia was proceeded with. The upper lip was split by an incision parallel to its outer surface from the vermillion border upward. This incision was carried well up into the tissues of the cheek. Numerous small foci of pus were thus evacuated. The lower lip was similarly split. Superficial incisions through the skin on the face to relieve tension. Irrigation of the tissues with peroxide of hydrogen; tube drainage and extensive wet dressing. The operation was well borne; six hours afterward the patient became comatose, and died with symptoms of acute pulmonary edema.

Comments.—This patient evidently suffered from a mixed infection of the face with diabetes. At the time of his admission he was thoroughly septic, and operation was performed as a *dernier ressort.*

As is usually the case, a rapid development of coma decided the fatal issue. It is reasonable to assume that an early, and thorough, surgical attack would have limited the advance of the inflammation and have probably saved the life of the patient.

1901, vol. i., page 54. *Tuberculosis of the Tongue; Deep Cauterization; Recovery.*—The patient, a married woman (F. N.), 38 years of age, who denied syphilis, was admitted December 18, 1900. About four months ago she noticed a small, painful blister on the left side of the tongue. The blister burst and left an ulcer, which latter gradually increased in size. The tongue became much swollen and painful, and interfered with swallowing and with speech.

On admission the tongue was not freely movable; showed a deep loss of substance on the left side, extending from the tip to opposite the second molar tooth. The edges of this defect were irregular, slightly undermined, hard, and indurated. The base was irregular, with small pearl-like projections. Another ulcer, smaller, but similar in character, was situated on the right side of the dorsum of the tongue. These ulcers corresponded to long, sharp, and projecting teeth which impinged upon the ulcerations. Submaxillary lymph glands enlarged, hard, but not painful. Lungs showed evidences of old tuberculosis. The diagnosis of tuberculosis of the tongue was confirmed by the pathologist's report on a section of the ulcer. It was considered probable that the tuberculosis was secondary to the pulmonary lesion, and was inoculated from the sputum by the long and sharp teeth of the patient.

December 28: Under chloroform the submaxillary glands were excised and the tuberculous ulcers of the tongue thoroughly cauterized. Teeth extracted. The sloughs slowly separated and left clean granulating surfaces, which were completely healed on February 13, when the patient was discharged cured. No recurrence has thus far been reported.

DISEASES OF THE LARYNX AND TRACHEA. TOTAL, 5; NO DEATHS.

	Total.	Cured.	Improved.	Died.
Ulceration of the larynx	1	..	1	..
Chronic benign inflammation of larynx	1	..	1	..
Tubercular perichondritis of cartilages	1	..	1	..
Extensive carcinoma of larynx	2	1	1	..

Operations on Larynx and Trachea. Total, 3; No Deaths.

Superior tracheotomy for laryngeal stenosis	1	..	1	..
Inferior tracheotomy for carcinoma laryngis	1	..	1	..
Complete laryngectomy for carcinoma	1	1	..	..

DISEASES OF THE CERVICAL GLANDS AND CELLULAR TISSUE. TOTAL, 12; 1 DEATH.

	Total	Cured	Improved	Died
Carbuncle of the neck (bronchopneumonia)	1	1	..	..
Abscess of the neck	2	2	..	..
Ludwig's angina	2	1	..	1
Tuberculosis of cervical glands	4	4	..	..
Lymphosarcoma of glands	1	1	.	..
Chronic glandular hyperplasia (Hodgkin's disease)	1	..	1	..
Recurrent carcinoma of glands	1	..	1	..
Operations on Glands—12; 1 Death.				
Incision of abscess	2	2	..	..
" " gangrenous submaxillary gland	2	1	..	1
Extirpation of glands	7	7	..	..
Incision of carbuncle of neck	1	1	..	..

1901, vol. iv., page 323. *Chronic Benign Inflammation of the Larynx: Tracheotomy: Improved.*—R. L., a housewife, 47 years of age, suffered *for several years* with difficulty in breathing and gradual loss of voice. She had been under the observation of a laryngologist, who put her upon antispecific treatment with no noticeable improvement in her symptoms. She had no tuberculosis, nor did any of her family suffer from this affection. She had a number of healthy children.

Upon admission on April 23, 1901, she was markedly dyspnoic; could swallow fluids only, and this with great difficulty. Laryngeal examination revealed a marked congestion and infiltration around the superior aperture: the infiltration was not like that of cancer or tuberculosis. Heart action rapid and irregular: no valvular murmurs. Urine acid, 1022, albumin, hyalogranular casts, no sugar. Temperature 100°, pulse 118. The dyspnea was so extreme that on April 24 a superior tracheotomy was done under cocaine anesthesia. The patient was much relieved by this operation and at once commenced to gain in physical strength. The heart's action became slower and more regular. On May 5 laryngoscopic examination showed both cords to be much congested, but moved slightly. Left arytenoid cartilage enlarged. Rima small and triangular.

May 18: General condition much better. Patient able to speak audibly. Laryngeal congestion diminished. Left arytenoid less swollen. The glottis opens widely during inspiration. The vocal cords move better and are less congested.

May 25: Right cord hypertrophied. Slight destruction of mucous membrane of larynx anteriorly and posteriorly. With tracheal opening closed, the glottis opens one-quarter inch posteriorly. Still some infiltration of anterior portion of larynx.

June 5: General condition much improved. Patient speaks audibly, and swallows well. Discharged in the care of her physician for further observation.

Comments.—For the present the nature of the infiltration must remain in doubt. In the absence of any syphilitic history, and with no improvement from antispecific treatment, we must dismiss syphilis as a causative factor in producing the lesion. With no tubercular foci in the lungs or other organs, with the marked improvement from simple tracheotomy, and from the appearance of the infiltrated tissues (entirely unlike that of tuberculosis), the disease cannot be ascribed to the tubercle bacilli. Its long duration and subsequent improvement would seem to exclude cancer. There remains only to be considered a chronic congestion and swelling of the laryngeal tissues, due possibly to some general systemic poisoning, the nature of which we do not know. The marked improvement resulting from tracheotomy was a striking feature of the case.

1901, vol. i., page 51. *Carcinoma of Larynx; Laryngectomy; During Convalescence Thrombosis of Transverse Cervical Veins; Incision and Drainage; Cure.*—William O'C., 60 years old, referred to the hospital by Dr. Gleitsman. His previous and family histories were negative. He never had syphilis or tuberculosis. Six years before, he had been waylaid by highwaymen who attempted to strangle him. Five months before his admission he felt a sensation as though a foreign body was lodged in his throat. He also occasionally felt a gagging sensation at swallowing. He lost no flesh or strength. Appetite fair.

On admission, November 26, 1900, examination revealed a small tumor in front of the thyroid cartilage, in the median line. This tumor was movable under the skin and upon the deeper tissues, was hard and of the size of a pigeon's egg. No glandular enlargements to be palpated. Laryngoscopy showed the vocal cords injected, left aryteno-epiglottic fold occupied by two small nodular masses, size of a pea; no ulceration visible. No change in epiglottis or base of tongue. Some huskiness of voice. A piece of the mass over the arytenoid fold had been excised by Dr. Gleitsman and reported by him to be carcinoma. Urine normal. Heart's action good. Temperature 99.6°. Diagnosis: Carcinoma of the larynx with metastasis in front of the thyroid cartilage.

November 30: Under $ChCl_3$ anesthesia a complete laryngectomy was performed. By a longitudinal median incision the trachea was opened and a canula inserted. The larynx was then freed on both sides well back to the esophagus. The trachea being divided and sewn into the lower angle of the wound by silk ligatures, the upper

end of the trachea was drawn upward by a sharp retractor, and thus the trachea and larynx separated from the esophagus up to the reflection of the mucous membrane of the pharynx. The carcinoma was here found to involve a part of the anterior esophageal wall, and this had necessarily to be widely excised. The upper attachments of the larynx were divided between the root of the epiglottis and the superior aperture. The hemorrhage was moderate. The glands on either side of the larynx were enlarged and hard, and were excised along with the larynx. The most difficult part of the operation was the closure of the gap in the esophagus and pharynx. Its upper limit had retracted very much and was very inaccessible. Three rows of catgut sutures securely closed the pharyngo-esophageal opening. Closure of the external wound, drainage, and insertion of large tracheal cannula. It was necessary to administer a subcutaneous saline infusion of 1,500 cem. at the end of the operation. Operation lasted three hours and fifteen minutes, the greater part of which was employed in closing the gap in the esophagus. Post-operative reaction good; pulse 92; highest temperature during the first week 101°.

Nourishment for the first three days was given by rectum.

December 3: Swallowed fluids. No leakage from the esophagus.

December 4: Took all nourishment by mouth; during the day took 51 ounces of fluids.

December 5: Leakage from the esophagus noticed; this gave rise to an ichorous discharge from the drainage openings.

December 7: Leakage quite abundant, necessitating administration of nourishment through a catheter passed through the mouth to below the fistula in the esophagus. The wounds at once became cleaner and the ichorous discharge ceased.

December 8: Tracheal anchor sutures removed.

December 13: Esophageal fistula appears to be closed and nourishment is again commenced by mouth, without the tube. Swallowing easy. Drainage wounds granulating nicely; phonates audibly. Increasing in weight.

January 4: The patient was to be discharged on this day. In the afternoon he had a severe chill, and the temperature, which had been normal for three weeks, rose to 104.4°, pulse 128, respiration 28. On January 7 he had another chill; meantime the temperature had fluctuated between 100.4° and 104 + °. On January 9 a deep-seated area of induration with edema of the integument was detected, corresponding to the origin of the left sterno-cleido-mastoid muscle. This was tender, but not painful.

January 12: Induration more marked. Superficial veins visibly dilated. Temperature continued high. No other cause for the temperature and chills.

January 14: Induration continued marked, with edema supra- and infraclavicular. It was decided to explore this area of induration.

Under $CHCl_3$ anesthesia the inner third of the left clavicle was resected, so as to afford good exposure. The transverse cervical and

suprascapular veins were found thrombosed. These veins were incised and their clots evacuated. The deep lymphatics accompanying the veins were infiltrated, dense, and yellowish in color. After evacuation of the thrombi within the veins, free bleeding from the veins followed. Drainage of the veins and external wound.

Reaction was again very good. The chills were not repeated. The temperature became normal on the day following and remained so. The external wound was closed by secondary suture a week later. Uninterrupted convalescence and gradual gain in weight. Discharged cured February 11, 1901.

Comments.—Of especial interest in this case is the septic thrombosis of the cervical veins six weeks after the operation. Was the cause thereof a secondary late infection through the lymphatic vessels accompanying the veins, or was it a direct infection from the drainage canals that for two weeks discharged an ichorous pus? If the former, it would be expected that the subclavian and jugular veins would have been infected, for the lymphatic stream enters directly into these trunks. If the infection came from the drainage openings, it is difficult to understand why no symptoms were manifested until several weeks after all ichorous discharge had ceased.

After-History.—A local relapse speedily followed the operation, and the patient died suddenly about five months after his discharge.

DISEASES OF THE BREAST. TOTAL, 17; DIED, 1.

	Total.	Cured.	Improved.	Unimproved.	Died.
Acute mastitis; abscess	4	4	..	..	..
" " " femoral phlebitis	1	..	1	..	..
" " " toxic synovitis of knee	1	1	..	..	..
Chronic " "	1	1	..	..	..
Lipoma of breast	1	1	..	..	..
Fibrocystic adenoma	4	4	..	..	..
Tumor in both breasts	1	..	..	1	..
Carcinoma of breast	1	..	..	..	1
Recurrent carcinoma of breast	1	..	1	..	..
Endothelial sarcoma	2	2	..	..	..

Operations on the Breast—16; 1 Death.

Incision of abscess	6	6	..	..	..
Excision of chronic abscess	1	1	..	..	..
" " lipoma	1	1	..	..	..
" " cystic adenoma	4	4	..	..	..
Amputation for carcinoma	1	..	..	..	1
Excision of recurrent carcinoma	1	..	1	..	..
Amputation for sarcoma	2	2	..	..	..

The acute suppurative diseases of the breast are usually referred to the out-patient department for incision and drainage. Retromammary abscesses are excellently drained by making a curvilinear incision at the margin of the breast in its lower quadrant, and then freeing and raising the breast from its underlying tissues. Besides affording the very best drainage, such an incision has an additional advantage in that the disfigurement of the breast and the mutilation of the gland tissues are avoided. A subacute mammary abscess was completely excised through such an incision. Benign tumors are by preference removed through a marginal incision.

For malignant neoplasms, the entire breast gland, with the underlying pectorals, and the lymphatics and glands of the axilla, are removed in one piece.

One death after amputation of a very extensive carcinoma of the breast and glands occurred. The patient, an elderly lady with myocarditis, never reacted well from the anesthesia. The temperature commenced to rise at once, with corresponding increase in the pulse rate, and death ensued from heart failure eighteen hours after operation.

The patients with endothelial sarcoma were 55 and 60 years old respectively. In one the disease had existed for three years and had involved the glands in the supraclavicular and axillary spaces of both sides. In the other the tumor was noticed six months before admission, and the axillary glands of the same side were involved. Amputation was performed in both cases. Nothing of their subsequent histories is known.

DISEASES OF THE PLEURÆ AND LUNGS. TOTAL, 6; DIED, 2.

	Total.	Cured.	Improved.	Died.
Empyema	1	1	..	..
Pyopneumothorax	2	..	..	2
Persistent pleural sinus	1	..	1	..
Unresolved pneumonia	1	1	..	..
Tuberculosis of lungs	1	..	1	..

Operations on Pleuræ and Lungs. Total, 4; Died, 2.

Thoracotomy (rib resection)	1	1	..	..
" " " for pyopneumothorax	2	..	..	2
Thoracoplasty and Délorme	1	..	1	..

DISEASES OF THE CHEST WALL. TOTAL, 2; NO DEATHS.

	Total.	Cured.	Improved	Died.
Tuberculosis of the costal cartilages	1	1	..	..
Recurrent sarcoma of the serratus magnus	1	1	..	..

Operations on the Chest Wall. Total, 2; No Deaths.

Excision of costal cartilages for tuberculosis	1	1	..	..
" " recurrent sarcoma of serratus magnus	1	1	..	..

The Délorme operation has been employed in several cases. Our experience with it has not been entirely satisfactory. It is an ideal operation for those cases in which the pyogenic membrane is confined to the lower limits of the pleural cavity. Where it extends to the apex of the lung, and has become intimately adherent to the large venous structures at the base of the heart, its separation is very difficult and attended with considerable risk. Especially difficult is the removal of the pyogenic wall from the apex of the lung, as free access to it can only be obtained by mobilization of the first rib.

In one of our cases, a very extensive pleural abscess cavity, the Délorme operation failed to effect a closure. A subsequent combination of the Délorme and Estlander operations speedily brought about a perfect cure.

1901, vol. iv., page 305. *Pelvic Abscess; Pyopneumothorax; Thrombosis of Inferior Cava; Pulmonary Embolus; Thoracotomy; Resection of Rib; Death.*—The patient, F. G., a housewife, 30 years old, had been admitted to the gynecological service January 8, 1901, for pelvic abscess. On February 27 she was transferred to the medical service. At that time there were physical signs of fluid and air in the left pleural cavity; temperature 102.8°.

March 4: Aspiration yielded turbid serum and gas.

March 9: Thoracotomy; resection of rib. Evacuation of large amount of pus and fibrin and gas.

March 10: Continued high temperatures, up to 104°. Profuse mucopurulent discharge from wound. No tubercle bacilli in sputum.

March 31: Suddenly, while sitting up in bed, fell back collapsed and died.

Postmortem. — *Lungs:* Emphysematous. Left lung compressed against the spine; almost carnified; covered with thick fibrin. Moderate amount of pus in pleural cavity.

Heart and vessels: Pericarditis externa; parenchymatous myocarditis. Thrombus in pulmonary artery and its main branches.

Thrombus rolled up, and in main part decolorized and firm. At its end there was a red thrombus (recent), not adherent. In vena cava, extending almost to diaphragm, a large, firm, decolorized, adherent thrombus; upper end larger and rounded. Thrombus extends into left common iliac vein and left internal iliac, down to site of pelvic abscess.

Spleen: Enlarged; capsule adherent; diffuse amyloid degeneration.

Kidneys: Slight evidences of interstitial nephritis. Ureter double on left side.

Liver: Nutmeg, large.

Adnexa: Large pus sac to left of uterus, containing inspissated pus.

Bacteriological examination of thrombus: Streptococci, small and atypical.

DISEASES OF THE STOMACH. TOTAL, 18; DEATHS, 6.

	Total.	Cured.	Improved.	Unimproved.	Died.
Carcinoma of esophagus and cardiac end of stomach[1]	2	..	1	..	1
Carcinoma of stomach	5	..	..	2	3
" " cardiac end of stomach	1	..	1	..	..
" " pylorus	5	..	4	1	..
Tumor (benign) of pylorus	1	1	..	..	..
Gastritis	1	1	..	..	..
Ulcer of stomach; acute anemia	1	..	..	..	1
" " " and perigastritis	1	1	..	..	..
Acute dilatation of stomach	1	..	..	..	1

Operations on the Stomach. Total, 14; Deaths, 5.

	Total.	Died.
Gastrostomy (Kader)	2	1
Jejunostomy (Witzel)	2	2
Laparotomy and cauterization of gastric ulcer	1	1
Gastroenterostomy (anterior-antecolic)	2	1
" (posterior-retrocolic)	5	..
Gastrotomy, secondary, for removal of Murphy button	1	..
Exploratory laparotomy for carcinoma of stomach	1	..

CARCINOMA OF ESOPHAGUS AND OF CARDIAC END OF STOMACH. TOTAL, 2; DEATH, 1.

Both cases were operated upon by establishing a gastric fistula by Kader's method—a method which has in the past given us very satisfactory results. Leakage did not occur after the removal of the tube.

[1]Operative treatment of carcinoma of the esophagus is at the present time only a palliative one (gastrostomy). The consideration of these cases is therefore included in this place.

In one of these cases death followed the operation, its cause being extreme debility and cachexia.

1901, vol. iii., page 140. *Carcinoma of the Esophagus; Carcinoma of the Cardiac End and of the Lesser Curvature of the Stomach; Operation (Gastrostomy, Kader); Death.*—Louis M., 59 years of age, was transferred from the medical service to the surgical division January 5. There has been marked difficulty in swallowing since a year and a half; the difficulty increased to such an extent during the last four months that even liquids could not be readily swallowed, most of them being regurgitated within fifteen minutes. Loss of weight amounted to over fifty pounds.

Operation January 6. Gastrostomy by Kader's method, preceded by an intravenous saline infusion. Patient did not rally after the operation, and died, in spite of vigorous stimulation, the same day.

CARCINOMA OF STOMACH AND PYLORUS, AND BENIGN TUMOR OF PYLORUS. TOTAL, 10[1]; DEATHS, 3.

As the operative treatment of these conditions is nearly identical, it seems proper to group them all together. Of the eleven cases enumerated above, one case (1901, vol. i., page 25) declined operation; on one case (1901, vol. iii., page 149) exploratory laparotomy only was done, the tumor being too extensive for extirpation, and there being, in the absence of stenosis, no indication present for anastomosis. Gastroenterostomy was performed seven times, five times posterior-retrocolic, twice anterior-antecolic. Twice the growth was so extensive, and the stomach so firmly fixed, that nothing remained to be done but jejunostomy.

In all cases of gastroenterostomy the Murphy button was employed. The method chosen was that originally described by Murphy. The results were not entirely satisfactory, inasmuch as the button failed to pass in a number of cases. This must be attributed to these factors: uneven pressure exercised by a defectively made flange of the button, or uneven pressure caused by the irregular puckering of the stomach wall included in Murphy's purse-string suture, or, finally, to a combination of both of these factors. But in no case did leakage occur.

That this defect of the button is not imaginary will be shown by the following case:

1901, vol. iii., page 150. *Carcinoma of Pylorus; Posterior-Retrocolic Gastroenterostomy; Retention of Button, causing symptoms*

[1]One case entered the hospital twice.

of Obstruction; Secondary Gastrotomy; Removal of Button; Recovery.—Julius E., 56 years of age, was transferred from the medical to the surgical service July 26. Past history was characteristic of pyloric stenosis; the symptoms, physical signs, and the result of the examination of the contents of the stomach being those of pyloric carcinoma.

Operation on July 26 under local anesthesia, consisting of posterior-retrocolic gastroenterostomy by means of Murphy's button. Things went well for nine days, patient taking considerable nourishment. The wound healed by primary union. On the ninth day the sutures were removed. The following night, during an attack of coughing, the entire wound burst open and was resutured. On the morning of the thirteenth day, though the feeding had been careful, patient began to vomit persistently. The usual efforts to control the stomach were ineffectual. Toward evening patient collapsed, his expression being anxious, the pulse wretched. He was removed to the operating room, where, under eucaine anesthesia, the scar was reopened and the incision extended downward to permit thorough and rapid exploration. The small intestine was empty, and the button could be felt where it had been placed at the time of the first operation. The anterior wall of the stomach was incised; the button was freed from the site of the anastomosis and was removed. The aperture of the button was found to be clogged with partly digested food. Suture of the gastric incision, followed by suture of the external wound, terminated the operation.

The vomiting ceased at once.

The wound healed by primary union, and patient was discharged improved September 1.

Note.—In February, 1902, the patient was presented in an excellent condition to the Surgical Section of the New York Academy of Medicine.[1] He had gained seventy-five pounds in weight.

In addition to the case just reported there were others in which the button failed to pass. There was another case of obstruction caused by a retained button which had to be removed by gastrotomy. This patient, however, remaining under treatment beyond the time embraced in this report, the history will have to appear in next year's Hospital Reports.

Of the 11 (respectively 10) cases of malignant disease of the stomach, three ended lethally. A short extract of their histories is herewith given.

1901, vol. iii., page 144. *Extensive Carcinoma of Stomach with Fixation of the Organ; Jejunostomy; Death.*—Celia G., 56 years of age, was admitted to the hospital January 15. For five months

[1] N. Y. Medical Record, March, 1902.

symptoms of pyloric obstruction were extant. On examination a large, hard, nodular tumor was found in the epigastrium. Patient was extremely emaciated and cachectic.

Operation January 16. A carcinoma was found, involving the entire stomach and omentum, and forming a very large and immovable mass which occupied the space behind and below the liver. Gastroenterostomy was impossible, and jejunostomy by Witzel's method was done.

Patient died six days later of exhaustion.

1901, vol. iii., page 147. *Carcinoma of Stomach; Operation (Anterior-Antecolic Gastroenterostomy); Death.*—Wolf W., 50 years of age, was admitted to the hospital September 18 with the following history: Patient complained for four months of pain and a dragging sensation in the region of the stomach, accompanied by a loss of flesh and strength. On examination there was found in the region of the epigastrium a mass, the size of two fists, very movable, and changing its position freely with the position of the patient. As there were no symptoms of pyloric stenosis, gastroenterostomy was not indicated. On account of the mobility of the tumor, its extirpation was suggested to the patient, but was declined. Patient was discharged unimproved.

He was readmitted November 5. During this time the gastric symptoms became so pronounced that patient desired an operation. While his general state was not much worse, the local condition changed in so far that the previously movable tumor had become fixed.

Operation November 8, 1901, under chloroform. On opening the abdomen an enormous tumor was found, involving the entire circumference of the pylorus, about half of the anterior wall, two-thirds of the posterior wall, and contiguous portions of the greater and lesser curvatures of the stomach. The operation consisted of an anterior-antecolic gastroenterostomy by means of a Murphy button.

In the beginning everything went well. Primary union of the abdominal wound. One week after the operation patient began to fail, and died on the same day.

A limited autopsy revealed a faultless condition of the anastomosis, button still in place.

1901, vol. iii., page 148. *Carcinoma of Pylorus; Operation (Posterior-Retrocolic Gastroenterostomy); Recovery; Readmission; Jejunostomy; Death.*—Julius B. was admitted to the medical service of the hospital July 18 with the following history: Patient was complaining for two months of pain in the epigastrium after eating, followed by vomiting two or three hours later. Considerable loss of flesh and strength. On examination there was found a slight tenderness in the region of the pylorus, but no distinct tumor could be felt. Examination of the stomach contents after a test meal

showed only a trace of hydrochloric acid. The vomited matter resembled coffee-ground material, and its examination demonstrated the presence of hemin crystals.

He was transferred to the surgical service and operated upon on July 29. On opening the abdomen the pylorus was found to be occupied by a hard, nodular tumor about the size of a lemon. It was freely movable, but its extirpation was contraindicated by the presence of extensive glandular infiltration. Posterior-retrocolic gastroenterostomy was done. With the exception of a short post-operative delirium lasting twenty-four hours, the course of healing was uneventful. Primary union of the wound. Patient was discharged August 19, the button not having passed. A radiographic examination demonstrated the button one inch to the left and on a level with the umbilicus.

Patient was readmitted October 1. Ever since his discharge patient complained of pain and oppression felt in the epigastrium. During the last few days vomiting has set in again. Patient was kept under observation for ten days. In spite of a very cautious feeding the vomiting persisted, with very rapid loss of flesh and strength. Operation on October 11. On opening the abdomen the whole stomach, with the exception of a small portion near the cardiac end, was found to be infiltrated by a massive new growth. The contiguous portions of the jejunum also had numerous small metastatic deposits. The site of the former gastroenterostomy was carefully explored, and found to be surrounded by new growth, within which sat the button. As the uninvolved portion of the stomach was not available for a second gastroenterostomy, jejunostomy was done by Witzel's method.

The operation was well borne. Very soon, however, the patient became apathetic, and, growing weaker and weaker, died four days after the operation.

ULCER OF THE STOMACH. TOTAL, 2; DEATH, 1.

Of the two cases of ulcer of the stomach, only one demanded operative interference, this becoming necessary on account of copious and uncontrollable bloody vomiting. Though the resulting anemia was very grave, as a last resort, operation was decided upon. Patient survived the operation only about twelve hours. Following is a brief extract from the history of the case:

1901, vol. iii., page 142. *Gastric Ulcer: Hematemesis: Profound Anemia; Gastrotomy; Cauterization of Gastric Ulcer, and Gastroenterostomy (Anterior-Antecolic); Death.*—Fannie S., 18 years of age, was admitted July 25 to the medical division of the hospital. Present illness began two weeks prior to admission with severe pains in the epigastrium, recurring every two or three hours, each parox-

ysm lasting about half an hour. Up to three days before admission there was no vomiting. Then she vomited a large quantity of bright-red blood (according to her statement, about one quart). The bloody vomiting recurred the following day; stools tarry. On admission a blood count showed 3,499,000 red blood cells, 12,000 white blood cells, and 50 per cent. hemoglobin. During her stay on the medical side of the hospital (six days) patient vomited at different periods large quantities of blood. Pulse became steadily more rapid and feeble, and the general condition became progressively worse. The medical treatment being unsuccessful, operative interference was decided upon, and patient was transferred to the surgical division.

We found the patient exsanguinated; the pulse 156, soft and thready; hemoglobin 30 per cent. General anesthesia being inadmissible, the operation was done under eucaine anesthesia, and was done at the expressed request of the attending physician.

Incision, six inches long, downward from the ensiform cartilage. The peritoneal cavity being opened, the stomach was at once exposed. On handling the stomach patient complained of nausea. She then vomited several ounces of black blood and a large clot. Inspection of the anterior wall of the stomach and palpation showed no indications of an ulcer. Palpation of the posterior wall revealed an area of induration near the pylorus and close to the lesser curvature, which was about the size of a ten-cent piece. The stomach was delivered into the wound, and the peritoneum was walled off by iodoform-gauze packings. An incision, about four inches long, was made through the anterior wall of the stomach parallel to its long axis, one end being at the pylorus. Four silk fillets were passed, at each angle, through either margin of the incision, and its edges were separated by traction. A quantity of dark-colored blood was wiped out of the stomach. Digital exploration of the suspected area revealed an ulcer. Hemorrhage had ceased. By means of four broad retractors every part of the mucous surface of the stomach was successively exposed to view, demonstrating that no other ulcer was present. The floor and margins of the ulcer were seared with the actual cautery. A large vessel could be felt pulsating immediately underneath the floor of the ulcer. This circumstance forbade a deep cauterization.

The gastric incision was closed, in its pyloric portion, with a double row of continuous Lembert sutures. The other angle of the wound was utilized for the establishment of an anastomosis with a coil of the jejunum (Murphy button). Peritoneal toilet; closure of the abdomen.

Duration of the operation, one hour. During the entire operation the patient complained of air-hunger; the pulse flagged so rapidly that two saline infusions, of sixty ounces each, were administered.

Patient never rallied perfectly from the operation. The pulse became more and more imperceptible, although stimulating medica-

tion brought an evanescent response. August 1, at 1 A.M., pulse became imperceptible, and patient died at 4 A.M., fourteen hours after the operation.

Epicrisis.- A fundamental rule of medicine is the checking of dangerous hemorrhage. There is no reason why a dangerous hemorrhage issuing from the stomach should form an exception to this rule. It seems that in this case more prompt interference might have checked the hemorrhage and eliminated the ulcer.

ACUTE DILATATION OF THE STOMACH. TOTAL, 1; DEATH, 1.

1900, vol. i., page 23. *Acute Dilatation of the Stomach (?); Intestinal Paresis; Pott's Disease; Death.*—Robert B., 22 years of age, was admitted to the hospital on December 28, 1900. Patient has had a kyphosis since early childhood. Present illness gives no history of traumatism or of the ingestion of poisons. Two days ago repeated vomiting set in. The vomit was never fecal, nor did it contain blood. It was projectile. Bowels have not moved since the beginning of the attack. Shortly before admission a rigidity of the extremities was noted, characterized by flexion at the elbow and wrist and by extension of the phalanges.

On admission following status was found:

General condition poor and emaciated; face anxious. *Upper and lower extremities*, as described; patellar reflexes absent; no paralysis; no cervical rigidity; no rigidity of the masseters. *Dorsal spine* showed kyphosis. *Lungs:* Some dulness at right apex. *Heart:* Negative, but is almost pulseless. *Abdomen:* Slightly rigid, not tender. Rectal examination negative. Temperature 102°, pulse 128, respiration 26.

When admitted the patient was practically moribund; he died eight hours later.

Autopsy revealed the following conditions:

Lungs: Abscess at the root of the left lung, its contents cheesy and odorless; no bone seems to be involved.

Heart: Negative.

Spleen: Chronic interstitial splenitis.

Kidneys: Chronic congestion and chronic diffuse nephritis.

Liver: Fatty and in a state of chronic congestion.

Stomach: Markedly dilated; it extended two fingers' breadth below the umbilicus, and was distended by greenish fluid containing small whitish and yellowish particles and some traces of blood. Contents amount to over two quarts. The stomach walls showed signs of acute inflammation, with hemorrhages; in places the wall was thickened and white; under the mucosa some gas blebs.

Duodenum and part of jejunum also dilated, contents fluid and of a greenish color.

Cecum: Wall is swollen and hemorrhagic; contents of cecum and of ascending colon bloody.

Spine: Bodies of fourth and fifth lumbar vertebræ were carious. Cord rested against this carious bone, but its membranes looked normal, except at one place where there was evidence of thickening of the dura. The pia looked normal everywhere. Cross-section of the cord showed no changes.

DISEASES OF THE SMALL AND LARGE INTESTINES. TOTAL, 14[1]; DEATHS, 12.

	Total.	Cured.	Improved.	Unimproved.	Died
I. Small Intestine (9):					
Ruptured duodenal ulcer	1	..	..	..	1
Traumatic (subcutaneous) perforation of jejunum	1	1	..	..	..
Intestinal perforation (typhoid ulcer) with diffuse purulent peritonitis	1	..	..	..	1
Sarcoma of small intestine; intestinal obstruction	1	..	..	..	1
Lymphosarcoma of small intestine	1	..	..	..	1
Carcinoma of small intestine	1	..	..	..	1
Intestinal obstruction by bands	2	..	..	..	2
Thrombosis of mesentery; gangrene of intestine	1	..	..	..	1
II. Large Intestine (5):					
Perforation of colon by trauma from within	1	..	..	..	1
Carcinoma of colon; operative intestinal obstruction	1	..	..	..	1
Carcinoma of colon	1	..	..	..	1
" " sigmoid flexure	1	..	..	1	..
Maldevelopment of colon; intestinal obstruction	1	..	..	..	1
III. Small and Large Intestines (5):					
Enterocolitis	1	1	..	..	..
Chronic constipation	4	1	3	..	..

Operations on the Small and Large Intestines. Total, 14; Deaths, 10.

	Total.	Deaths.
Laparotomy and drainage for abscess after perforation of duodenal ulcer	1	1
Laparotomy and drainage for diffuse purulent peritonitis after perforation of typhoid ulcer	1	1
Enterorrhaphy for traumatic rupture of jejunum	1	..
Ileosigmoidostomy for carcinoma of colon	1	1
" " sarcoma of small intestine and intestinal obstruction	1	1
Ileocolostomy for carcinoma of cecum	1	1
Laparotomy for intestinal obstruction by band	2	2

[1]In the above list there will be found a total of 19 cases enumerated, but enterocolitis and chronic constipation are so typically medical cases that practically they have nothing to do with the subject under consideration and on this account may be disregarded.

	Totals.	Deaths.
Exploratory laparotomy for carcinoma of sigmoid flexure	1	..
" " " endothelial carcinoma of small intestine	1	1
Exploratory laparotomy for lymphosarcoma of small intestine.	1	1
Secondary operation for intestinal obstruction by adhesions	2	..
Resection and end-to-end anastomosis of small intestine for mesenteric thrombosis	1	1

The preceding statistical tabulation will show the great mortality of our record in this class of cases. As the different lesions are practically represented by single cases, it is difficult to give a résumé of the subject-matter as a whole; each case must stand on its merits. On this account it has been deemed best to give a short history of each case with a few explanatory remarks where this seemed necessary.

RUPTURED DUODENAL ULCER. TOTAL, 1; DEATH, 1.

1901, vol. ii., page 84. *Ruptured Duodenal Ulcer; Retrocolic (Extraperitoneal) Abscess; Operation (Incision and Drainage); Death.*—Tillie B., 18 years of age, was admitted to the hospital on September 13 with the following history: The past history is negative, with the exception of an attack of pain in the right iliac fossa some months previous to the present illness. Present illness dates back ten days, and was characterized in the beginning by pain in the right iliac fossa, by fever and vomiting; the vomiting ceased, but the other symptoms persisted up to the time of admission. On admission a very tender mass, high up on the right side of the abdomen, running along the outer side of the colon, was made out. Temperature 101.4°, pulse 106, respiration 30.

Operation was done immediately on admission. Incision in the right iliac fossa, high up to the right; all the subcutaneous structures were much infiltrated. The incision into the peritoneum was followed by a gush of very foul-smelling pus. No attempt was made to find the appendix, the condition of the patient not warranting it. Insertion of two tubes for drainage. Irrigation of the cavity until the fluid returned clear.

On the day following the operation there was found a very profuse, acrid, watery discharge, requiring repeated changes of the superficial dressings. The discharge continued, in profuse amounts, from behind the ascending colon, and in the subsequent course caused considerable eczema on the edges of the wound. An attempt was made to close the fistula by deep packings, but on account of repeated vomiting the packings had to be removed. On the other hand, on account of the bad general condition of the patient operative closure of the fistula was entirely out of question. Gradually the pulse became weaker, until the patient died on September 21, eight days after the operation.

The autopsy revealed the following findings: In the posterior wall of the duodenum, 8 cm. from the pylorus, there was found a circular defect 1.5 cm. in diameter. This defect communicated with an abscess cavity. Its edges were sharp and necrotic. In the ascending colon, 8 cm. from the ileocecal valve, there was found another defect, about 2 cm. in diameter.

Peritoneum: No peritonitis, except that the peritoneal surface of the ulceration in the colon was necrotic and covered with fibrin. Kidneys showed congestion and chronic nephritis. In other respects the autopsy was of no importance.

TRAUMATIC (SUBCUTANEOUS) PERFORATION OF THE JEJUNUM.

TOTAL, 1; DEATHS, 0.

1901, vol. i., page 15. *Traumatic (Subcutaneous) Perforation of the Jejunum, caused by Passage of a Coal Cart over Abdomen; Operation (Enterorrhaphy); Secondary Intestinal Obstruction, due to Peritonitic Adhesions; Secondary Operation; Recovery.*—Samuel M., 10 years of age, was admitted to the hospital on November 18, 1900, with the following history: Twenty-four hours prior to admission patient was run over by a coal cart, the wheels passing over the abdomen in the hypochondriac and epigastric regions; this accident occurred between 7 and 8 P.M., the boy having eaten a hearty supper at 6 P.M. Immediately after the accident the patient had very severe pain in the abdomen; this pain continued practically up to the time of admission. No vomiting occurred for some time, and began only some hours later, after the administration of medicaments.

On admission the following status was found: General condition is good. The abdomen is generally rigid and tender; on percussion it is tympanitic, excepting between the free border of the left ribs and the umbilicus, where there is dull tympany; in this locality the tenderness is also most marked. Liver and splenic dulness entirely obliterated by tympany. The abdomen was too rigid to permit careful palpation, but an indefinite mass could be felt in the previously mentioned region, exhibiting dulness. Temperature 101°, pulse 116, respiration 36.

Operation on admission (twenty-five hours after injury), in chloroform narcosis. On opening the abdomen (median incision at the level of the umbilicus) some turbid serum, but no blood or feces, was found in the peritoneal cavity. The small intestines were eventrated and carefully searched for a perforation. At the duodeno-jejunal junction some fresh fibrinous adhesions were noted, and a perforation was found in the right side of the jejunal wall. Some coagulated albumin and a thin fluid were oozing out through the perforation. The perforation was about three-quarters of an inch in length, and its edges gaped, the mucosa protruding; it ran almost at right angles to the long axis of the gut, extending into the mesen-

teric attachment. After protecting the peritoneal cavity, the rent was closed with Czerny sutures of catgut reinforced by a double row of silk Lembert sutures. The rest of the peritoneal cavity, and the eventrated intestines, were washed with warm saline solution. Drainage with iodoform gauze, which led down to the suture line. Partial closure of the external incision by through-and-through silkworm-gut sutures. During the operation patient went into collapse and became cyanosed, so that artificial respiration and active hypodermatic stimulation had to be resorted to. Duration of the operation, forty-five minutes.

The primary result was exceedingly satisfactory in all respects for the first nine days. On the 26th, patient complained for the first time of pain in the abdomen; on the 27th vomiting occurred. By this time the abdominal sutures had been removed, but there was found considerable necrosis of the abdominal wall, infection having taken place through a stitch hole. Patient continued to complain of considerable pain in the abdomen; there was frequent and copious vomiting; bowels, which had been moving regularly without artificial aid, ceased in this function, even after repeated enemata; the pulse rate rose to 122; facial expression became anxious. In other words, a typical picture of intestinal obstruction developed. It was decided, therefore, again to reopen the abdomen.

Operation, November 29. Laughing-gas anesthesia. Incision along the old scar. After separating other adhesions, a band was found, about three inches below the upper angle of the wound, which tightly constricted a loop of small intestine. The intestine above the band was dilated, while the portion below it was completely collapsed; this, however, equalized itself immediately after division of the band. Closure of the incision.

Patient's bowels moved within a few hours after the operation, and the general condition also was very much improved. From this time on convalescence continued uninterruptedly until his final discharge on January 16, 1901.

Epicrisis.—The prognosis of this case was no better than that of any of the others enumerated. The following points established its extreme gravity: first, the injury occurred only about one hour after a preceding meal; secondly, the operation was performed twenty-four hours after the injury. Another point of interest is the secondary intestinal obstruction relieved by the division of a peritoneal band.

INTESTINAL PERFORATION (TYPHOID ULCER) WITH DIFFUSE PURULENT PERITONITIS. TOTAL, 1; DEATH, 1.

1901, vol. ii., page 85a. *Diffuse Purulent Peritonitis, caused by Perforation of a Typhoid Ulcer; Operation (Incision and Drainage);*

Death.—Aaron K., 18 years of age, was admitted to the medical service of the hospital at 3 P.M. on November 15. On account of the apparent indifference of the patient, no history of any value could be obtained. Pulse was 104, of good quality and full; temperature 101.4°. Without any marked increase in the pulse rate, however, the temperature rose in the evening to 104.6°.

On the following day (November 16), the general condition remained about the same; morning temperature 98.8°, evening temperature 104.8°; toward evening, however, the pulse became feebler and intermittent; a positive Widal reaction was reported.

On the following day (November 17) the general condition was decidedly worse. Patient began to vomit a dark-greenish fluid resembling bile; the vomiting persisted throughout the entire day, the pulse all the time remaining of poor quality and its rate 84 to 98. At 2 P.M. it became still more rapid. Repeated blood examinations during the day gave following values: at 11:30 A.M. 3,500, at 5 P.M. 4,200, at 8 P.M. 8,000 white blood cells. The abdomen was tense, rigid, and slightly distended; the area of liver dulness was diminished; tenderness over the entire abdomen; slight dulness in both flanks, the dulness varying with the posture of the patient. The diagnosis of typhoid perforation was made, and patient was transferred to the surgical service.

Operation November 17 at 9 P.M. When seen by the surgeon the patient did not present a very encouraging aspect. Facial expression was distinctly Hippocratic; pulse 200 and over, respiration 40. But, in view of the otherwise surely fatal outcome, the operation was consented to. It was decided to operate in cocaine anesthesia, but toward the middle of the operation full anesthesia (ether) was substituted.

On opening the abdomen in the median line, slightly turbid fluid and gas escaped from the general peritoneal cavity; fresh fibrin was found on and between the intestinal coils. A mass was felt in the right iliac fossa; as the intestines were separated in this region, a thick fluid, resembling typhoid stools, welled up into the wound; the cecum was reddened, and in one spot had the appearance of beginning mortification. Numerous heavy deposits of fibrin were found on the intestinal coils in this region; several loops were examined, but no perforation was found. The appendix, which was much injected and inflamed, was deligated and removed. On account of the collapsed condition of the patient, no further search was permissible. The abdominal cavity was irrigated with hot saline solution and drained in all directions.

After the operation the condition of the patient remained extremely poor, requiring vigorous stimulation, the response being unsatisfactory. He died in less than three hours later.

At autopsy, twelve inches from the ileocecal valve, a perforation of the small intestine was found; this perforation was completely covered with a heavy deposit of fibrin, so as to be invisible. In

addition there existed a large collection of pus in the right iliac fossa, running up toward the liver. The ileum showed other ulcers, some recent, and some in process of healing.

Epicrisis.—While the prognosis in typhoid perforation is at best only a very doubtful one, all authorities are agreed on this one point, that the mortality increases at a frightful rate in proportion to the time which has elapsed since the actual perforation; some authorities go even so far as to admit of good results only in the preperforative stage. While doubtless the results would be better if patients were subjected at this stage to operation, it must also be conceded that it is difficult to foretell which cases will actually go on to perforation and which will not; on the other hand, in the present state of our knowledge, it will be rather difficult to persuade both the medical and the lay mind to an operation, with all its attending and undeniable risks, in the so-called preperforative stage. At the present time we must be satisfied with the dictum that surgical interference shall step in as soon as perforation is strongly suspected, or very soon after its actual occurrence. If the case has gone on to the development of a fulminant peritonitis, the prognosis is almost surely fatal.

From the history of this case it is by no means easy to judge at what time the perforation occurred; but, relying upon the appearance of the abdominal contents and the diffuse purulent peritonitis, it is safe to assert that it must have occurred a considerable length of time previous to the operation. Operation in this case was consented to, by the surgeon, only as a last resort, and with but very little hope for success.

SARCOMA OF SMALL INTESTINE; INTESTINAL OBSTRUCTION. TOTAL, 1; DEATH, 1.

1901, vol. ii., page 86. *Sarcoma of Small Intestine; Intestinal Obstruction; Operation (Ileosigmoidostomy); Death.*—Charles C., 39 years of age, was admitted to the hospital on July 22 with an indefinite history of frequent vomiting, and of severe pain in the right iliac fossa, for the past six weeks; the pain was colicky in character and radiated to different parts of the abdomen; at the greatest intensity of the pain there was considerable gurgling, the intestinal contractions being visible to the patient himself. Physical examination revealed in the left iliac fossa a firm, nodular mass about the size of a fist; this mass could also be palpated through the rectum. The abdomen was distended and tympanitic, and showed the peristaltic movements of the intestines, particularly in the umbilical region. Bowels constipated, even when enemata were administered. Temperature 100.4°, pulse 102.

Operation on admission. The abdomen was opened by an incision through the left rectus. The palpating hand revealed a stony-hard, immovable, nodular mass, completely infiltrating the root of the mesentery, extending along the mesentery downward and to the left, and terminating in the left iliac fossa, where it occupied a space as large as an adult fist, involving many loops of adherent small intestine. The loops of small intestine which presented in the wound were much distended; adjoining loops, as well as the large intestine, were collapsed.

Owing to the extent of the disease, a radical removal was entirely out of the question. An anastomosis (side-to-side) was therefore made between the dilated small intestine and the sigmoid flexure. Drain inserted to the suture line; partial closure of the abdomen.

Patient reacted well after the operation; very soon the bowels moved spontaneously; he took nourishment, and his general condition was very encouraging. At 7 P.M. (about twenty-four hours after operation) it was noted that the patient, without any premonitory symptoms, suddenly collapsed and a moment later died.

At autopsy two tumors were found in the small intestine; the upper one 90 cm. and the lower one 40 cm. above the ileocecal valve. The lower tumor almost completely filled the lumen of the gut, while the upper one was smaller in size (walnut). In addition there were found metastatic deposits in all the mesenteric glands. The anastomosis was found to connect the small intestine (170 cm. above the ileocecal valve) with the sigmoid flexure (40 cm. above the anus).

Microscopical diagnosis: Round-celled sarcoma.

Epicrisis.—No definite reason can be given for the sudden collapse, nor was there any pathological cause for it found at autopsy.

LYMPHOSARCOMA OF SMALL INTESTINE. TOTAL, 1; DEATH, 1.

1901, vol. i., page 16. *Lymphosarcoma of Small Intestine; Operation (Exploratory Laparotomy); Death.*—Mary L., 17 years of age, was admitted to the hospital on November 5, 1900, with following history: Patient has been suffering for the past two or three years from frequently recurring attacks of severe pain in the epigastric and umbilical regions, accompanied by vomiting. These attacks lasted two or three hours, and occurred principally after the ingestion of food. Bowels at times constipated; the stools at times diarrheal in character, occasionally mixed with blood. During the past month the pain has been continuous, and is now localized more particularly in the right lumbar and in the umbilical regions. There were in addition, from time to time, more acute, cramp-like exacerbations.

The physical examination revealed the following conditions: The abdomen was relaxed. In the right lumbar region there was to be felt a globular, nodular tumor about the size of an apple. This

tumor was hard, slightly tender, movable, and moving with respiration. Considerable collection of fluid in the dependent portions of the abdomen. The tumor was apparently not adherent to the parietal peritoneum; on inflation of the colon this structure was found to be superficial to it. The diagnosis vacillated between a tumor of the ascending colon and a retroperitoneal tumor which had separated the mesentery. In the urine a trace of albumin and considerable indican were found.

Operation November 12. Median incision at the level of the umbilicus. On opening the peritoneum the tumor was found to be adherent to the parietal wall; free serum occupied the peritoneal cavity. Palpation of the mass showed it to be a cystic tumor holding close relations with the intestines; it was the size of an orange, of a pale pink color, and had apparently developed from within the lumen of the intestine. Its peritoneal covering, as well as that of the intestines in its neighborhood, was covered with a fibrinous exudate. The other portions of the small intestine in the vicinity of the tumor contained, for a considerable distance on either side of the main tumor, a number of hard nodules, showing extensive dissemination. The retroperitoneal glands were much enlarged. On account of the extensive involvement of the intestines and of the poor condition of the patient, further operative procedure was discontinued. Closure of the abdomen.

In the subsequent course the general condition of the patient continued very poor, with a rapid and feeble pulse. Patient complained of considerable pain in the abdomen, but there was no infection observable in the wound. Patient continued to lose ground, and finally died from exhaustion on December 16, 1900.

At the autopsy there was found a seropurulent peritonitis, the infection doubtless having occurred from the previously described tumor of the ileum, which at one spot was at the point of perforation. Other tumors were present in its vicinity and in the retroperitoneal mesenteric glands.

Epicrisis.—It can be stated without hesitation that no causal connection is to be found between the death of this patient and the exploratory laparotomy, death having occurred over one month after the operation. The lethal termination of this case was due to the natural progress of the disease.

CARCINOMA OF THE SMALL INTESTINE. TOTAL, 1; DEATH, 1.

1901, vol. ii., page 87. *Endothelial Carcinoma of the Small Intestine; Operation (Exploratory Laparotomy); Death.*—Simon K., 35 years of age, was admitted to the medical service of the hospital on August 15 with the following history: Present illness began five weeks ago with severe cramp-like pains in the abdomen, particularly

in the hepatic region, accompanied by diarrhea. Considerable loss of flesh and strength.

Examination of the abdomen was practically impossible on account of the extreme rigidity; in anesthesia, however, a small, freely movable mass, the size of a plum, was found to be situated just below the umbilicus, in front of the vertebral column. Examination of the stomach contents showed an absence of free hydrochloric acid, but also an absence of lactic acid.

Patient was kept under careful observation on the medical side of the house, no additional symptoms, with the exception of vomiting and a loss in weight of 16 pounds, having developed.

He was transferred to the surgical service on September 5, and an exploratory laparotomy was undertaken at the express request of the gentlemen serving on the medical division.

At the operation a lemon-sized tumor was found, involving a loop of the small intestine. It was situated in the pelvis; the peritoneum in general, and the mesentery as well, were studded with metastases. Operative interference of a more radical nature was therefore contraindicated and the operation discontinued..

Directly after the operation, the duration of which was only twenty minutes, patient began to fail, and, in spite of vigorous stimulation, died six hours later.

No autopsy permitted. Microscopical diagnosis: Endothelial carcinoma.

INTESTINAL OBSTRUCTION BY BANDS. TOTAL, 2; DEATHS, 2.

(a) 1901, vol. ii., page 90. *Acute Intestinal Obstruction by Band; Operation; Death.*—Max K., 30 years of age, was admitted to the hospital on October 15 with following history: Of the past history, only this fact might have had some relation to his present illness. Patient was treated three years ago, at one of the New York hospitals, for an attack of appendicitis, but was not operated upon. Since that time he has always enjoyed good health. Present illness was of thirty-six hours' duration. After an indiscretion in diet he was suddenly taken ill with vomiting and severe cramps in the abdomen, but his bowels moved just after the onset. The pain was so severe that morphine had to be administered by a physician. On the following morning he was seen by a member of the attending staff of the hospital, and the diagnosis of a possible intestinal obstruction was made. At this time a mass was felt also in the left iliac fossa. Purgatives (calomel and salts) and a high oxgall enema were administered, but without any effect, some gas and a few particles of feces only being expelled.

Patient was admitted to the hospital, and, as further attempts to evacuate the bowels were unsuccessful, operation was proceeded with.

Operation October 16. Median laparotomy. On opening the abdomen a small amount of bloody serum escaped. A loop of dis-

tended and congested small intestine presented in the wound, and a short search revealed collapsed intestine below. On tracing the latter upward a broad, band-like adhesion was found, extending from the mesenteric attachment almost to the free border; this adhesion caused an angular kinking of the intestine at this point. This adhesion, as well as its apparent continuation on the under surface, was carefully dissected away from the intestine; but it was so intimately adherent to the underlying peritoneum that in the dissection a portion of the latter had to be sacrificed. In endeavoring to close the defect by suture, the intestine was accidentally punctured, but immediately closed by Lembert sutures. Directly after liberating the adhesion the collapsed portion of the intestine filled with gas. The appendix was also searched for, but found to be perfectly normal. After careful toilet of the peritoneum, closure of the wound.

The patient left the operating table in good condition, but collapsed immediately thereafter, requiring vigorous stimulation. In spite of this the pulse gradually failed, and patient died nine hours later.

A limited autopsy showed still a partial collapse of the intestine distally to the site of the previous constriction, and a dilatation above it. Death in this case was most probably due to paralysis of the intestine.

(b) 1900, vol. i., page 18. *Acute Intestinal Obstruction, due to Peritoneal Bands and Adhesions; Operation; Death.*—Morris B., 33 years of age, was admitted to the hospital on December 4, 1900, with the following history: With the exception of a syphilitic infection ten years ago, and a chronic constipation, the past history is negative. About fifteen hours before admission, and after a heavy meal, patient was suddenly taken ill with severe cramp-like pains in the abdomen; at first the pains were localized in the umbilical region, but later on they became general. He has vomited repeatedly, the vomitus consisting principally of biliary matter.

Physical examination showed that the abdomen was very slightly distended, but very rigid and tender. In the right iliac fossa there was to be palpated an indefinite mass which was dull on percussion; some dulness was also present to the left of the umbilicus. Rectal examination revealed a large, bulging, somewhat tender mass which was very firm in consistence and occluded the lumen of the rectum.

Immediate operation. Incision along the outer border of the right rectus. On opening the peritoneum free serous fluid welled up into the wound. Small intestines presented. As these coils were examined, several abnormal peritoneal bands were noted, one of which, close to the posterior parietes, seemed to constrict the gut and bound it tightly down in close proximity to the fossa of Treitz. After separating this adhesion the intestine was liberated, and it readily filled with gas. The mesentery of the jejunum was much

injected. The appendix was searched for, found on the postero-external aspect of the cecum and ascending colon, running up to within half an inch of the liver, embedded in adhesions; it was dissected out of its bed and removed. After suitable drainage, closure of the abdominal incision. Duration, one and a half hours.

After the operation patient seemed to react well, but very soon he began to vomit, and the bowels, in spite of enemata, refused to act. He also complained continuously of severe pain in the abdomen, which was tympanitic and tender. An attempt was made to check the vomiting by lavage of the stomach, but, on account of the unruliness of the patient, the introduction of the tube was impossible. The patient continued to vomit and seemed to be rapidly getting worse, hence the decision was arrived at to reopen the abdomen.

Operation twenty-four hours after the primary laparotomy. This operation, in the nature of an exploration, revealed nothing of further interest, excepting distended and injected small intestines and collapsed large intestine; the incision was therefore only repacked.

After this operation the general condition continued as before; the vomiting continued unceasingly; patient became restless and delirious; pulse gradually failed, and he died twenty-four hours later.

No autopsy was permitted.

Epicrisis.—It is a fairly well recognized axiom that of all etiological factors which cause intestinal obstruction, bands are most readily dealt with, and are most amenable to treatment, provided that they are removed in time. Both of our cases, however, ended lethally; in the first case the direct cause was an intestinal paresis; in the second case no autopsy was possible, hence the cause of death remains unknown.

THROMBOSIS OF MESENTERIC VESSELS. TOTAL, 1; DEATH, 1.

1901, vol. ii., page 98. *Thrombosis of Mesenteric Vessels; Gangrene of Intestine; Operation (Resection of Intestine); Death.*—Leah S., 47 years of age, was admitted to the hospital on May 17 with following history:

Family history is negative.

Past History.—Patient has had, during the past eight years, two attacks of cerebral embolism.

Present History.—Three weeks ago, after lifting a very heavy weight, patient began to have very severe pains in the abdomen, particularly in the region of the umbilicus and in the back; the pains did not radiate; there were no other symptoms at first. For the past two weeks her bowels have not moved, excepting with the aid of enemata, and even then scantily. For the past three days bowels have not moved at all, nor has flatus been expelled. During the last three days all ingesta have been promptly vomited, and on the

day of admission, according to the statement of the patient, the vomiting had been fecal. Patient had not voided any urine during the thirty-six hours preceding her admission to the hospital.

Status Presens.—Physical examination revealed the following points: The heart was slightly enlarged; aortic sound was accentuated. The abdomen was distended and tympanitic, except in the dependent portions, where dulness was present. No distinct mass was to be felt. Occupying the right iliac region, and extending across the median line, there was an indefinite resistance with considerable tenderness. Urine contained albumin in abundance. Temperature was 98.6°, pulse 120, respiration 36.

Immediate operation. Before beginning, patient received a subcutaneous infusion of eight ounces of saline solution. Incision four inches long, in the median line, at the level of the umbilicus. On opening the peritoneal cavity some bloody serum escaped. To hasten matters the incision was extended to eight inches. The intestines, which presented in the wound, were apparently normal; in the left iliac fossa, however, a loop of very tense, black, gangrenous gut was seen. Patient was placed in Trendelenburg's position and the gangrenous loop brought into the wound. The margins of the gangrenous area were sharply defined, but no constriction was found; the mesenteric vessels supplying this portion of the intestine were thrombosed.

The mesentery was deligated and resected well beyond the gangrenous area, which was about fourteen inches long; and after tying the intestine off with iodoform gauze, the intervening twenty inches of gut were resected. End-to-end anastomosis by means of a Murphy button. On account of the collapsed condition of the patient, after the insertion of suitable drainage, rapid closure of the abdominal incision followed.

During the operation the patient's condition became markedly worse. When placed in Trendelenburg's position the breathing became much embarrassed and the pulse worse. As the intestinal resection was begun, the patient's condition was such that the prone position had to be resumed, and patient received another intravenous infusion of thirty ounces of saline solution. Before the intestinal resection was completed another infusion became necessary. The operation was finished as rapidly as possible, and patient was placed in bed, where she died a few minutes later.

Autopsy.—Thrombosis of the mesenteric veins, thrombi dark-red in color; the arteries clear; the mesentery as a whole edematous. The intestine is congested, the mucosa showing occasional small ulcerations. The mesenteric nodes are enlarged. The branches of the portal vein contain recent thrombi. The splenic vein is thrombosed; the spleen is large and congested. Cultures and spreads from the portal thrombi showed the presence of streptococci.

Epicrisis.—This case adds another to the growing, and yet com-

paratively small, list of gangrene of the intestine due to thrombosis of the mesenteric vessels. The striking feature of this case is the indefinite history. From the nature of the lesion it can hardly be assumed that the condition as found at operation had lasted three weeks, and yet it is but natural to seek some causal connection between the exertion of three weeks ago and subsequent events. The pathological picture closely resembled those cases described as mesenteric thrombosis; and the intestine is identical with those in which there is a sudden stoppage of the circulation, *e. g.*, in some forms of volvulus of the sigmoid and in some forms of strangulated hernia. There are no pathognomonic symptoms, and the diagnosis of mesenteric thrombosis is very problematical. The prognosis, as is well known, is very bad, although there are some cases on record in which prompt surgical interference has proved to be successful. The treatment can be only a surgical one.

LARGE INTESTINE.

TRAUMATIC PERFORATION OR RUPTURE OF THE COLON. TOTAL, 1; DEATH, 1.

1901, vol. ii., page 85. *Perforation or Rupture of Colon; Admitted in Moribund Condition; Death.*—Mary R., 11 years of age, was admitted to the hospital on November 21 with following history: Patient is habitually constipated, a full week frequently elapsing between evacuations, which do not come without cathartics and enemata. There was no movement of the bowels during the past week; repeated cathartics and enemata were ineffectual. On the morning of the day of admission a high oxgall enema was administered by her physician through a soft rectal tube; thereupon the patient went into collapse; the abdomen immediately began to distend; with the distension the patient began to vomit, and has repeatedly vomited since.

On admission, within a few hours after the enema, the condition of the patient was described as follows: Patient is moribund; face pinched and drawn; tongue moist and heavily coated; pulse imperceptible; heart sounds very rapid, scarcely to be heard. The abdomen was enormously distended, tense, and generally tender; liver dulness obliterated by the abdominal tympany. Rectal examination negative.

Patient was infused and vigorously stimulated, but died within two hours after admission.

No autopsy was permitted.

Epicrisis.—It is to be regretted that no autopsy could be made in this case. The rapid development of the symptoms and the rapidly

supervening death after the high enema, seem to justify the belief that we had to deal with either a perforation of the bowel by the rectal tube or with a rupture of the intestine from the distension by the enema. The question remains open whether the particular portion of the intestine was healthy or whether it was diseased. If not, why should it have given way so readily? It might be argued that the case was one of a fulminant peritonitis and no doubt this was superadded, but the immediate development of the distension is to be accounted for only by the assumption of an escape of intestinal gases.

CARCINOMA OF ASCENDING COLON. TOTAL, 1; DEATH, 1.

1901, vol. ii., page 88. *Carcinoma of Ascending Colon; Operation (Exclusion of Intestine); Operative Ileus; Death.* O. P., 48 years of age, was admitted to the hospital on July 30. The main features of the previous history were pain in the right side of the belly, growing constipation, and loss of weight and strength. Examination of the cachectic-looking patient elicited the presence of a movable, roundish, nodular tumor connected with the ascending colon. A malignant tumor of the ascending colon was diagnosticated.

Operation August 1. Incision two inches above and parallel to the anterior third of the iliac crest and outer half of Poupart's ligament, dividing all the fascial and muscular layers and the peritoneum. The caput coli was at once exposed. About three inches above the caput coli the colon was seen to be invaded by a hard, nodular, annular tumor, about the size of an orange, which constricted the lumen of that part of the intestine. The mesenteric glands, extending high up to the root of the mesentery, were infiltrated, enlarged, and hard. The liver appeared to be normal, and no other metastases were noted. As a radical extirpation of the growth and involved glands was impossible, an end-to-side ileocolostomy was decided upon, so as to forestall the obstruction to the fecal movement which would certainly result from the continuous growth of the tumor and the stenosis dependent thereupon.

A loop of the ileum, apparently about eight inches above the ileocecal valve, was withdrawn from the abdomen, and two temporary fillets of iodoform gauze were placed as constricting bands around it. On account of massive adhesions, considerable difficulty was encountered in this, the preliminary part of the operation.

Most of the manipulations had to be carried out by the sense of touch only, unaided by the sense of sight. The small intestine was divided, and what, after repeated verification, appeared to be its distal end was closed by Czerny-Lembert sutures. Into the proximal end one-half of a Murphy button was inserted. The ascending colon, about five inches distally to the tumor, was delivered out of the

abdomen, and at the site of its anterior longitudinal band the other half of the Murphy button was inserted. The ileocolic anastomosis was then completed by closure of the button.

Two omental grafts were then loosely sutured with fine catgut around the site of the junction of the two halves of the button; one protecting an apparently weak point in the joint, the other covering over what appeared to be a small hematoma, produced by pressure of the button against the wall of the ileum.

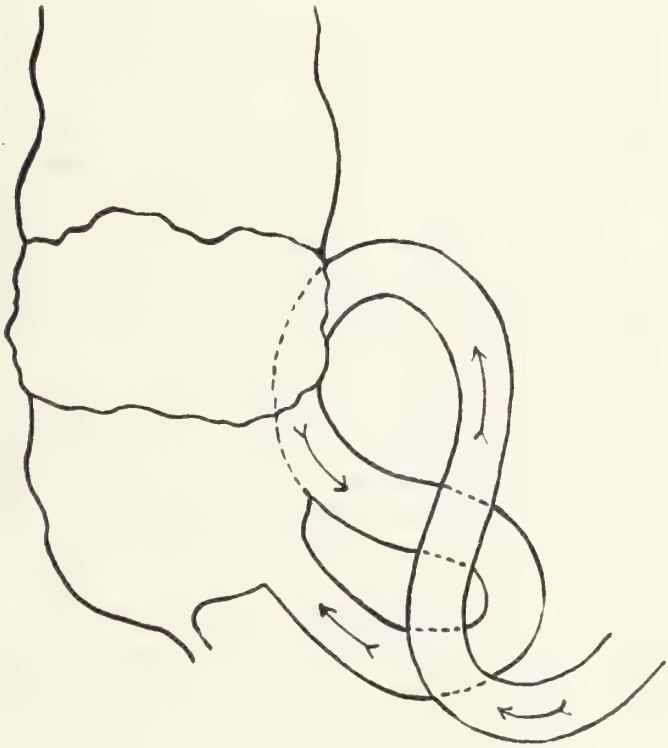


FIG. 1.

After toilet of the peritoneum, closure of the wound by tier sutures followed.

On the day following the operation there was noted some distension of the abdomen and some vomiting, which was attributed to the use of the anesthetic; small quantities of liquids taken by mouth were vomited. When nourishment was withheld the vomiting stopped. But whenever the attempts at feeding were renewed the vomiting returned. The administration of calomel and saline purgatives caused

incessant vomiting and led to a rapid deterioration of the general condition. When the presence of intestinal obstruction had become evident, the patient's condition was so bad that the idea of reopening her abdomen was abandoned. Finally the vomiting became fecal; patient became restless and delirious, the pulse became imperceptible, and death followed on August 5.

Autopsy revealed the following condition:

Operative abdominal wound negative.

On opening the abdomen a large, white, hard, nodular tumor was found involving the upper half of the cecum and the beginning of the ascending colon. The tumor obstructed the lumen of the intestine, it being possible to pass one finger only through it. On opening the intestine the tumor was found to be a typical hard carcinoma with overhanging, thick edges. The inner surface of the tumor was found to be ulcerated, and covered with a greenish membrane.

An anastomosis had been made, by means of a Murphy button between the ileum and ascending colon; and the oral end of the ileum was found sewn up, causing an absolute intestinal obstruction. The part of the ileum above the suture line was not particularly distended, but the upper ileum and the jejunum, duodenum, and stomach were markedly distended and congested. Some clear fluid in the peritoneal cavity. Mesenteric nodes near tumor infiltrated by the new growth.

Spleen flabby and congested.

Kidneys lobulated and congested; capsules adherent.

The ileum was as sketched (see Fig. 1). Distal loop of ileum was coiled up and ran partly behind cecum, where it was embedded in a mass of carcinomatous glands. Here it formed a loop, which on returning doubled upon and crossed itself. The cecum, at the site of the tumor and below it, was firmly adherent to the underlying parts.

Epicrisis.—The deplorable error committed by the surgeon in this case was caused by the following conditions: The abdominal incision, made mainly for the purpose of exposing the tumor, did not reach far enough downward to freely expose to the eye the relations of that portion of the ileum immediately adjoining the cecum; thus, in the presence of multiple adhesions, a very pronounced retraction of the mesentery, and fixation of both the cecum and the ileum to the iliac fossa, a clear estimation, under the control of the eye, of the true relations was impossible. As the withdrawing of the fixed intestine out of the wound was impossible, the surgeon depended upon the sense of touch alone to trace the ileum backward from the ileocecal valve. By looking at the adjoining schematic sketch, made by the pathologist, the modus of the error can be readily compre-

hended. It will be noted that a large loop, comprising about fourteen inches of the gut, following the small intestine in the reverse sense from the ileocecal valve, passed upward and to the level of the intestinal tumor, where it was firmly attached to the retracted cancerous peritoneum; from there it is seen to return again to the iliac fossa, crossing the first loop, and from there continuing on toward the stomach. In passing the ileum through between the fingers, inch by inch, both legs of the double loop were put on the stretch simultaneously, the surgeon being unaware of the fact that two cylinders, instead of one, were being passed through his fingers. Thus it happened, furthermore, that having passed the point of crossing of these two cylinders, the fact was not observed that the finger passed on to the distal instead of to the proximal part of the loop. While the afferent end was occluded by suture, on one hand, a circulus vitiosus was established on the other hand, reconnecting with the ascending colon the distal portion of the divided gut.

The question may be raised with propriety why the fact of an intestinal obstruction was not diagnosticated early enough to repair the mischief. To this question the reply will be found in the peculiar behavior of the occluded intestine, lacking the usual signs of distension at the site of the occlusion; the portion of the ileum situated immediately above the occlusion being collapsed and empty, while the uppermost portions of the small intestine—*i.e.*, the jejunum and duodenum—were considerably distended. Another fact may be added, that the character of the vomiting observed during the first two days after the operation was not characteristic and did not differ from that observed after prolonged anesthesia. It became only significant after the administration of calomel and salts, and, simultaneously with this, the general condition of the patient deteriorated so suddenly and rapidly that the thought of surgical interference was abandoned.

CARCINOMA OF COLON. TOTAL, 1; DEATH, 1.

1900, vol. iii., page 17. *Carcinoma of Hepatic Flexure of Colon; Operation (Ileosigmoidostomy); Death.*—Samuel L., 42 years of age, was admitted to the internal service of the hospital on November 5, 1900. Briefly outlined, the history was one of chronic stenosis of the colon. On examination there was found a hard, nodular tumor in the hepatic flexure of the colon; with this diagnosis he was transferred to the surgical service.

Operation December 17. On account of extensive glandular involvement, merely an ileosigmoidostomy was performed.

Patient reacted well after the operation, but gradually grew weaker and apathetic, and died on December 23.

A limited autopsy showed a stenosing tumor of the hepatic flexure of the colon, which on subsequent microscopical examination was found to be a malignant adenoma.

CARCINOMA OF SIGMOID FLEXURE. TOTAL, 1.

1901, vol. ii., page 89. *Carcinoma of Sigmoid Flexure; Operation (Exploratory Laparotomy); Discharged Unimproved.*—Lena G., 65 years of age, was admitted to the hospital on August 11, 1901, with the following history: The past history and physical examination are analogous to the preceding case, except that in this case the tumor involved the sigmoid flexure.

Operation August 16. Exploratory laparotomy. The tumor was too extensive for radical removal, and ileocolostomy was impossible because the tumor involved the lowest portion of the sigmoid. In addition there was also found a dermoid cyst of the right ovary, putting further obstacles in the way of successful operation. Closure of the abdominal incision.

There were no complications from this operation, and patient was discharged unimproved on September 4.

MALDEVELOPMENT OF THE COLON; INTESTINAL OBSTRUCTION. TOTAL, 1; DEATH, 1.

1901, vol. ii., page 94. *Intestinal Obstruction, due to Maldevelopment of the Colon; Operation (Enterostomy); Death.*—Infant S., 36 hours old, was brought to the hospital on April 1, 1901, with what appeared to be an atresia of the rectum. The abdomen was very much distended, peristaltic movements of the intestine being plainly visible through the abdominal walls. A probe entered the anus for a distance of about two inches, and then apparently met with an obstruction.

Operation without anesthesia. Search for the blind proximal end of the rectum was abandoned, and instead colostomy decided upon. The subsequent course of the operation was the following: Incision two inches long in the left iliac region. On opening the peritoneal cavity considerable dark-colored serum escaped. An ineffectual search was then made for the descending colon, and finally the peritoneal reflection of the descending colon was sought and found. By the aid of this landmark a cord-like structure, about the thickness of a goosequill, and resembling the normal adult appendix, was brought out in the wound. This structure was traced downward into the pelvis; upward to a point situated in the median line, where it was found directly attached to the distended small intestine.

The true condition being recognized, enterostomy had to be done. A loop of distended small intestine was sutured into the wound, this part of the operation being exceedingly difficult on account of the thinness of the intestinal walls. The gut was immediately opened, whereupon large quantities of meconium were voided. The child survived the operation by about fourteen hours.

On autopsy there was found a complete stenosis of the entire colon, extending from the cecum to the anus, the lumen barely admitting an ordinary silver probe. It contained traces of mucus and some desquamated epithelium. The ileocecal valve was closed by adhesion of the opposed surfaces; above the valve the small intestine was normal and contained meconium in abundance.

DISEASES OF THE APPENDIX. TOTAL, 98; DEATHS, 10.

	Total.	Cured.	Improved.	Unimproved.	Died.
Acute catarrhal appendicitis	7[1]	6	1	..	..
" appendicitis with localized abscess	16	15	..	..	1
" gangrenous and perforative appendicitis	41	39	..	..	2
" " appendicitis with mesenteric thrombosis	2	..	..	..	2
Acute gangrenous or perforative appendicitis with diffuse purulent peritonitis	8	4	..	..	4
Acute gangrenous appendicitis with seropurulent peritonitis	2	1	..	..	1
Acute perforative appendicitis with multiple abscesses	2	2	..	..	..
Subacute catarrhal appendicitis	1[1]	..	1	..	..
Empyema of appendix	3	3	..	..	..
Chronic catarrhal appendicitis	14	14	..	..	..
" appendicular sinus	1	1	..	..	..
Carcinoma of appendix (primary)	1	1	..	..	..

Operations on the Appendix. Total, 105; Deaths, 10.

	Total.	Died.
Appendicectomy, incision completely closed	16	..
" and drainage	59	5
Secondary appendicectomy and drainage	6	..
Appendicectomy with free drainage of peritoneal cavity	7	5
Incision and drainage of appendicular abscess	11	..
Secondary median laparotomy for abscess	1	..
" rectal incision for abscess	2	..
" suture after operation for appendicitis	2	..
" operation for infection after appendicectomy	1	..

To obviate misconception, it may be proper to state at once that the following remarks on the subject of appendicitis are not meant to

[1]One case not operated.

be taken for a broad discussion of the question, but represent merely a review of the cases which, during the past year, were treated in the First Surgical Division of the hospital. An occasional reference to the experience of past years will be found useful for comparison. The reader is referred to Volumes I. and II. of the reports of Mount Sinai Hospital, in which operative details of the methods employed receive ample discussion.

If the statistical portion of this report is compared with the corresponding reports of preceding years, certain changes in the arrangement and in the nomenclature will be evident. With so varied a material it is not easy properly to classify all our cases, especially when we consider that many of the various forms merge almost imperceptibly into others. In the present arrangement an attempt was made to classify the different forms according to the gross pathological condition of the appendix itself, as seen with the naked eye in the fresh state. The only superiority of this arrangement is in its simplicity. It cannot be denied, at the same time, that it also offers opportunities for error. One of the drawbacks of this arrangement is, however, that often the picture of a given case is dominated to such an extent by complications outside of the appendix that the pathological condition of the appendix itself is found comparatively insignificant.

It is to be regretted that unanimity regarding the nomenclature of appendicitis has not been, as yet, reached. Following are descriptive examples of the nomenclature adopted:

1. ACUTE CATARRHAL APPENDICITIS.

(a) 1901, vol. ii., page 1.—Abraham K. Appendix two and a half inches long, rigidly contracted, and vividly congested. When opened longitudinally its basal third was found to contain blood and mucus; the mucous membrane markedly thickened and congested; no ulcerations; its distal two-thirds in evident state of atrophy and impending obliteration.

(b) 1901, vol. ii., page 5.—Samuel W. Appendix two inches long; serosa thickened; mucosa much thickened, with slight superficial erosions; lumen not narrowed.

2. ACUTE APPENDICITIS WITH LOCALIZED ABSCESS.

(a) 1901, vol. ii., page 44.—Isaac L. Appendix two inches long; walls thick, very friable, not gangrenous. During the operation a well-localized abscess was found in the right iliac fossa, bounded in general by the peritoneum of the right iliac fossa, the colon, and adherent omentum.

(b) 1901, vol. ii., page 45.—Annie C. Appendix five inches long; walls very thick and congested. Apex obliterated for one inch; canal very minute. Mucosa swollen. Mesentery very thick and friable. During operation an abscess was found to the inner side of the colon.

3. ACUTE GANGRENOUS AND PERFORATIVE APPENDICITIS.

In the former reports considerable stress was laid upon the presence or absence of a perforation in the appendix. If the subject be closely examined, however, it will be readily seen that the difference is more one of degree than of kind. On the other hand, the integrity of the appendix in gangrenous appendicitis, even without perforation, is so much compromised, and transmigration of infecting organisms may occur so readily through its walls, that it was deemed proper to group these cases together in this report.

(a) 1901, vol. ii., page 10.—Maria F. Appendix three inches long; the distal one inch shows a sloughing serosa covered with lymph; mucosa gangrenous, with large perforations; in the proximal part the mucous membrane is injected, red, and thickened.

(b) 1901, vol. ii. page 11.—Louis L. Entire appendix is much thickened; serosa intensely congested; mucosa necrotic throughout and gangrenous in spots. No coproliths, no strictures, and no perforation; but at one spot the wall was so thinned that only the serosa was left intact.

(c) 1901, vol. ii., page 13.—Harry E. Appendix two inches long, very thick and fleshy; serous membrane deeply congested; mucous membrane destroyed, excepting at tip; lumen obliterated in the distal half-inch.

4. ACUTE GANGRENOUS APPENDICITIS WITH MESENTERIC THROMBOSIS.

The statistical report shows that we had occasion to observe two cases of this variety. From the nature of the lesion it will be readily appreciated that an exact anatomical diagnosis is impossible before operation, and can only be guessed at during the operation. This variety naturally gives a bad prognosis; both of the cases died, and the subsequent autopsy verified the diagnosis.

(a) 1901, vol. ii., page 68.—Eleanor Z. The appendix is three inches long; it is club-shaped and in its distal two-thirds duskily congested. It was reflected upward and backward into a peritoneal pocket behind the cecum. The mucous membrane of the proximal one-third appears to be normal; at the junction of the proximal and middle thirds there is a stenotic portion, behind which the appendix appears to be much thickened and congested; the mucous membrane

of this portion is necrosed throughout, and in one spot, the size of a hempseed, is perforated into the retroperitoneal space of the mesenteriolum.

The patient died three days after the operation. Autopsy showed a thrombosis of the mesenteric veins leading from the veins of the mesoappendix. No portal thrombosis.

(b) 1901, vol. ii., page 67. Minnie L. Appendix markedly congested and swollen; mucous membrane gangrenous throughout; its mesenteriolum also gangrenous.

This patient was operated upon on April 22, and died in a pyemic condition on July 15. The autopsy report will be found in the death reports of appendicitis.

5. ACUTE GANGRENOUS OR PERFORATIVE APPENDICITIS WITH DIFFUSE PURULENT PERITONITIS.

In this, one of the most virulent types of appendicitis, the pathological anatomy of the appendix is interesting only because it forms the basis of the infectious process in the peritoneum. The appendix is usually gangrenous, often also perforated. The perforation is usually in open communication with the free peritoneal cavity, the tendency to limitation by the formation of adhesions being absent or insignificant. Occasionally we have to deal with the secondary rupture of a well-defined abscess of older standing into the free peritoneal cavity.

(a) 1901, vol. ii., page 9. Jacob J. Appendix three and a half inches long, dumbbell-shaped, *i.e.*, dilated at either end and considerably narrower in the middle. In both dilated portions a large coprolith was found. The mucosa lining the distal portion completely gangrenous. Serosa throughout much thickened.

During the operation a large amount of pus flowed out from the free peritoneal cavity; no localized abscess was found, and the only adhesions were found in the shape of a band at the tip of the appendix.

(b) 1901, vol. ii., page 35.—Jacob L. Appendix as thick and as long as the middle finger of an adult, slightly curved upon itself, and intensely congested. Two perforations visible externally. Lumen full of fluid feces and fecal concretions. The whole mucosa was completely gangrenous, presenting a mottled green, yellow, and black surface. The walls edematous and thickened.

During the operation, on opening the peritoneum, there was a gush of greenish purulent fluid; this fluid was absolutely non-encapsulated, coming from all directions of the general peritoneal cavity.

6. ACUTE GANGRENOUS APPENDICITIS WITH DIFFUSE SEROPURULENT PERITONITIS.

This form of appendicitis differs from the preceding only in the gross appearance of the exudate. It is, pathologically and bacteriologically, identical with it. Prognostically it is perhaps milder in its course and more amenable to treatment.

7. ACUTE GANGRENOUS OR PERFORATIVE APPENDICITIS WITH MULTIPLE ABSCESSES.

This form of appendicitis is allied to the form described under the heading of acute appendicitis with abscess. The difference lies in the fact that while in the latter there is only one abscess adjacent to the appendix, in this other variety we find one or more encapsulated abscesses situated at a distance from the primary focus. These remote abscesses are most frequently in the pelvis, occasionally between the intestines or in the omentum.

(a) 1901, vol. ii., page 15.—Abraham W. Appendix two inches long. At about its middle there is an ulcer, in the centre of which there is a small perforation; about half an inch from its base there is a well-marked constriction.

During the operation there were found one abscess communicating with the appendix, a second walled-off abscess in the pelvis.

(b) 1901, vol. ii., page 47.—Bertha S. Appendix not removed, because it was deemed inadvisable to prolong the operation, on account of the bad general condition of the patient.

During the operation there were found three distinct, separate, noncommunicating abscesses; the first one at about McBurney's point, the second one to the outer side of the colon, and the third one in the region of the umbilicus.

8. EMPYEMA OF THE APPENDIX.

1901, vol. ii., page 65.—Morris L. The appendix was three inches long and deeply congested; the appendix itself erect and evidently under great tension. Along the convexity of the appendix a number of yellowish discolorations are to be seen. On laying open the appendix its contents were found to be pus, and the entire mucosa gangrenous. The above-mentioned yellowish spots corresponded to places where perforation of the serosa was threatened.

9. CHRONIC CATARRHAL APPENDICITIS.

It is needless to state that these are all cases operated upon in the interval, being preceded by one or more attacks. The pathological picture varies very much, viz.:

(a) 1901, vol. ii., page 71.—Joseph N. First attack two years ago, last attack four weeks ago. During this time patient never was entirely free from pain. Appendix three inches long, congested, and contained a fecal concretion; mucous membrane thickened and uneven; no ulcerations.

(b) 1901, vol. ii., page 76.—Alfred C. First attack three months ago, second attack soon thereafter. Appendix five inches long; apex club-shaped; proximal part much thinner in diameter. Mucosa congested, slightly hemorrhagic in places; in one place small superficial ulcers. Apex obliterated.

(c) 1901, vol. ii., page 78. David N. First attack one year ago, last attack two months ago. Appendix one and a half inches long and about one-third inch thick, and much congested. Apex surrounded by a peculiar gelatinous material dotted with white granules. The appendix is very firm, and appears to represent a closed sac. On section the lumen was found to contain glairy, dark yellow material resembling mucoid feces; one-third of its proximal portion is completely obliterated; its wall is much thickened.

(d) 1901, vol. ii., page 82. Julius B. First attack six months ago, second attack four months ago, last attack one week ago. Appendix two and a half inches long and about one-sixth of an inch thick; very firm to the touch, and curved upon itself at its middle; it has two very tight strictures, which do not admit even a very fine probe.

10. SUBACUTE APPENDICITIS.

11. CHRONIC APPENDICULAR SINUS.

12. CARCINOMA OF THE APPENDIX.

It will be found interesting to compare the figures of the present report with those of the reports of preceding years.

During 1898[1] there were operated upon 149 patients, of whom 27 died, giving a mortality of 18.12 per cent.

During 1899[1] there were operated upon 144 patients, of whom 42 died, yielding a mortality of 29.16 per cent.

During 1900 there were operated upon 115 patients, of whom 28 died, with a mortality of 24.34 per cent.

During 1901 there were operated upon 96 patients, of whom 10 died, which represents a mortality of 10.41 per cent.

It will be seen from these figures that during the past year there is to be noted a gratifying reduction in the rate of mortality. What

[1]During 1898 and 1899 the entire surgical service was united under one head.

are the causes of this improvement? Growing familiarity with the malady and improvement of the operative technique obviously have their share in partially explaining the favorable change. But a full explanation will be afforded only by the fact that the character of the cases admitted has become much better. The number of cases, formerly so numerous, presenting the ultimate forms of far-gone infection—cases in which the disease was either not recognized at all, or, if recognized, did not receive prompt and adequate treatment—the number of these desperate forms of the disorder has materially diminished. This will become evident if we study the following figures:

In 1898, out of 149 patients, 22 cases showed diffuse peritonitis, or a percentage of 14.76.

In 1899, out of 144 patients, 39 cases showed diffuse peritonitis, or a percentage of 27.08.

In 1900, out of 122 patients, 29 cases showed diffuse peritonitis, or a percentage of 23.77.

In 1901, out of 98 patients, 10 cases only had diffuse peritonitis, or a percentage of 10.20.

Diffuse Peritonitis.—In 1898 22 cases of appendicitis with diffuse peritonitis were operated upon, with a mortality of 14, or 63.63 per cent.

In 1899 39 cases of appendicitis with diffuse peritonitis were treated the same way, with a mortality of 29, or 74.35 per cent.

In 1900 29 cases of appendicitis with diffuse peritonitis were treated, with a mortality of 16, or 55.17 per cent.

In 1901 10 cases of appendicitis with diffuse peritonitis were operated upon, with a mortality of 5, or 50 per cent.

Mesenteric Thrombosis.—In 1899[1] there was treated 1 case of appendicitis with mesenteric thrombosis and secondary portal phlebitis, with a mortality of 1, or 100 per cent.

In 1900 2 cases, with a mortality of 100 per cent.

In 1901 2 cases, with a mortality of 100 per cent.

If these somewhat more detailed statistics are examined and compared in turn with the gross statistics, three points will become evident: First, that the improvement in our statistics, while undoubtedly present, is not as great as would appear at first sight. Secondly, that the mortality in severe cases, *i.e.*, those accompanied by either diffuse

[1]No cases of this nature were reported in 1898.

peritonitis or mesenteric thrombosis, has not improved very markedly. And thirdly, that the prognosis in appendicitis in general depends upon the presence or absence of complications.

In the introductory remarks of past reports, the fact has been repeatedly emphasized that one of the main objects of these annual reports is much more to call attention to the fatal than to the successful cases.

It will be seen that we have had during the year 1901 ten deaths in this branch of our service, viz.: 2 cases of acute gangrenous appendicitis; 1 case of acute appendicitis with localized abscess; 2 cases of acute gangrenous appendicitis with mesenteric thrombosis and secondary portal phlebitis; 4 cases of acute gangrenous appendicitis with diffuse purulent peritonitis; 1 case of acute gangrenous appendicitis with diffuse seropurulent peritonitis.

Their histories are extracted as follows:

Case I., 1901, vol. ii., page 54. *Acute Gangrenous Appendicitis; Abscess; Appendicectomy and Drainage; Death.*—Louis R., 14 years of age, was admitted to the hospital October 28, 1901, with typical history and symptoms of appendicitis. Temperature 104.4°, pulse 116, respiration 24.

Immediate operation. Incision and drainage of an abscess containing about two ounces of foul pus; removal of a brittle and gangrenous appendix. Patient died twenty-four hours later with symptoms of progressive sepsis.

Case II., 1901, vol. ii., page 69. *Acute Gangrenous Appendicitis; Abscess; Appendicectomy and Drainage; Death.*—Morris G., 11 years of age, was admitted October 2, 1901, with history and symptoms typical of appendicitis; had also a chill, indicating systemic infection. Temperature 101°, pulse 120, respiration 26.

Immediate operation. Incision and drainage of an abscess and removal of a gangrenous appendix. On the following day jaundice was noted, which increased during the next days. Patient became deeply septic, without any signs of peritoneal irritation, and died three days later.

Case III., 1901, vol. ii., page 62. *Acute Appendicitis with Circumscribed Abscess; Appendicectomy and Drainage; Death.*—Lieba O. was admitted February 3, 1901, with typical history and symptoms of an acute appendicitis. Duration of seven days.

Immediate operation. Evacuation and drainage of an abscess and removal of the appendix, two inches long, its mucosa swollen and slightly congested, its tip embedded in the abscess and covered with a fibrinopurulent deposit. No ulcers and no perforations. The

patient left the operating table in a good condition. About six hours later the pulse suddenly became weak, and the patient died in spite of energetic stimulation. No autopsy.

Case IV., 1901, vol. ii., page 67. *Acute Gangrenous Appendicitis; Mesenteric Thrombosis; Appendicectomy and Drainage; Secondary Portal Phlebitis; Pyemia; Death.*—Minnie L., 40 years of age, was admitted April 22, 1901, with the following history: During the past four years patient had had three attacks of appendicitis; present attack began three days ago with a chill, and with sharp pain in the right iliac fossa. The pain persisted with increased severity, and was accompanied by vomiting. On the second day of the attack another chill was observed; a third one on the day of admission. Physical examination revealed undoubted signs of appendicitis. Temperature 103°, pulse 128, respiration 28.

Immediate operation. Removal of the appendix, which was markedly swollen, congested, and gangrenous throughout; its mesenteriolum was also gangrenous and brittle, so that there was difficulty in its deligation

The subsequent course was that of a pronounced pyemia: daily chills, and high temperatures, followed by corresponding remissions. In spite of this severe course, the condition persisted for a very long time, and the patient finally succumbed on July 15, almost three months after operation.

The autopsy revealed in the pelvis a large abscess, bounded by the uterus below, above and laterally by intestines. In the mesentery there was another large abscess cavity. Suppurating tracts led from this cavity to the portal vein, which contained no pus, nor an obstructing thrombus, but there were on its walls firm yellow deposits, evidently the remnants of purulent parietal thrombi. In the liver, along the branches of the portal vein, there were to be seen some white nodules of pinhead size, which the pathologist pronounced to be old miliary abscesses.

Case V., 1901, vol. ii., page 34. *Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Operation; Death.*—Hannah S., 9 years old, was admitted January 16, 1901, with a typical history of a first attack of appendicitis. Temperature 102°, pulse 136, respiration 28. On examination there were found the usual physical signs, and in addition extreme tenderness over the entire abdomen.

Immediate operation. Pus was found in the free peritoneal cavity; extirpation of a gangrenous, perforated appendix.

Patient did not react well; her pulse gradually failed, and she died about thirty-six hours after the operation.

Case VI., 1901, vol. ii., page 35. *Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Operation; Death.*—Jacob L., 16 years of age, was admitted August 11. Temperature 103.6°, pulse 112, respiration 26.

Immediate operation. Patient reacted well, but soon fell into a condition of noisy delirium. The peritonitis became progressively worse, and patient died about seventy-two hours after the operation.

To avoid repetition the remaining cases are briefly referred to as follows:

Case VII., 1901, vol. ii., page 36. *Acute Gangrenous Appendicitis with Diffuse Purulent Peritonitis; Operation; Death.*—Morris B., aged 5, admitted July 21, died July 22.

Case VIII., 1901, vol. ii., page 37. *Acute Gangrenous Appendicitis with Diffuse Purulent Peritonitis; Operation; Death.* Harris S., aged 33, admitted August 9, died August 12.

Case IX., 1901, vol. ii., page 68. *Acute Gangrenous Appendicitis with Diffuse Purulent Peritonitis; Operation; Death from Blood Sepsis.*—Morris G., aged 11, admitted October 2, died October 6.

Case X., 1901, vol. ii., page 61. *Acute Ulcerative Appendicitis; Multiple Abscesses; Diffuse Seropurulent Peritonitis; Operation; Secondary Abscess in Douglas' Cul-de-sac; Secondary Operation; Death.* Jacob G., 31 years old, admitted January 27, died February 1.

DISEASES OF THE LIVER AND SUBPHRENIC SPACE. TOTAL, 15; DEATHS, 8.

	Total	Cured	Improved	Unimproved	Died
Abscess of liver	5	2	..	..	3
" " " ruptured, with purulent peritonitis	1	..	..	..	1
Abscess of subphrenic space	2	2	..	..	..
Atrophic cirrhosis of liver	1	..	..	..	1
Syphilitic hepatitis	2	..	1	..	1
Carcinoma of liver	2	..	1	1	..
Actinomycosis of liver	1	..	..	..	1
Echinococcus cyst of liver and lungs	1	..	..	..	1

Operations on the Liver and Subphrenic Space. Total, 16; Deaths, 8.

	Total.	Died.
Transpleural hepatotomy for abscess of liver	4	2
Transperitoneal hepatotomy for abscess of liver	1	1
" " " ruptured abscess of liver and diffuse peritonitis	1	1
Transperitoneal hepatotomy for actinomycosis of liver	1	1
" " (secondary)	2	..
Transpleural operation for subphrenic abscess	2	..
" " " echinococcus cyst of liver	1	1
Omentopexy for cirrhosis of liver	1	1
Exploratory laparotomy for syphilis of liver	2	1
" " " carcinoma of liver	1	..

The great majority of the patients of Mount Sinai Hospital are Russian Jews. Their habits, mode of living, and their occupations are mainly of a sedentary character. Their confining work, usually of long hours, often leads to disturbances of the intestinal tract. A great number of them suffer from hemorrhoids. It seems probable that the etiological factor of a certain number of our liver abscesses is to be found in this disorder. It may suffice to refer to the frequent traumatisms to hemorrhoids, to subsequent ulcerations and thrombosis, and to the intimate anatomical relation of the hemorrhoidal veins with the portal system. Strict pathological proof of this theory is lacking, but its assumption gains additional strength from the fact that the causes brought forward as etiological factors in these cases will all be found to be of a negative character. With one exception (vol. iii., 1901, page 157), no ulcerative or amebic infection was ever found; nor have any of our patients ever resided under the tropics.

Operative Technique.—Some reference has been made to our operative technique in the annual report of last year. This point is again alluded to because, in a number of cases, a new modification has been devised and successfully employed.

As a general rule the abscess is attacked where its superficial location is indicated by symptoms and exploratory puncture. This may be in front, *i.e.*, below the free costal margin, with or without resection of one or more ribs, well guarding against an injury to the pleura; or laterally, or from behind, penetrating through thoracic wall and the diaphragm.

1. *The anterior or abdominal operation* is so well known that it is mentioned here merely for the sake of completeness; nor is there any need to further add that it is suitable only in that comparatively small number of cases where the liver abscess is situated in front and has produced a marked, palpable enlargement of the liver.

2. *The posterior or lateral route.* This is the method not only of choice, but also of necessity, where the abscess is located in the more inaccessible portions of the liver, *i.e.*, in the dome or in the lateral portions of the liver; it might be said, also, that it is the most suitable operation for abscesses involving the subdiaphragmatic space.

As is well known, the operation, in the main, consists of the following steps:

(*a*) Resection of one or more ribs.

(*b*) Isolation of the pleural cavity.

(*c*) Isolation of the peritoneal cavity.

(*d*) Incision and drainage of the abscess.

The success of this operation depends upon the exactness with which the second and third steps are carried out. The modification above mentioned refers particularly to the second step.

(a) Resection of one or more ribs. Pus having been aspirated by puncture through an intercostal space, an incision, four to five inches long, is made directly over this interspace parallel with the course of the ribs. After retraction of the superficial structures, from three and a half to four inches of the ribs adjoining are resected subperiosteally. To aid contraction, favoring rapid obliteration of the abscess cavity, resection of more than one rib is preferable.

To render the field more accessible, the intercostal vessels are deligated at both extremes of the wound by mass ligature; the intercostal nerves are divided, and the intervening intercostal muscles are extirpated. On the completion of these preparatory steps, we shall find before us an area extending about four inches by two inches, the structure thus exposed being the external surface of the parietal pleura.

(b) Isolation of the pleural cavity. Various methods have been used for attaining this purpose. Sometimes the operation was done in two sittings; the object of the first sitting being the formation of adhesions between the two opposed pleural surfaces by suture or caustics. Recently, to prevent infection of the pleural cavity, sufficient reliance has been placed upon simple suture, followed by immediate evacuation of the abscess. But, adopting this method, the suture must be close and exact, otherwise pleural infection is surely followed by empyema, a grave, and occasionally a fatal, complication.

Infection of the pleural cavity may occur through gaping places between the stitches, or, if the suture itself is tight, through the stitch holes. This may happen either at the time of the primary evacuation or later. To prevent these mishaps the writer has devised the following modification of the technique:

The parietal pleura is rapidly stitched, with a small, strong, full-curved needle, in a continuous catgut suture to the diaphragmatic pleura. Each stitch should also include the diaphragm. When this suture is finished, it will be seen that some of the stitch holes are gaping, this being due to the lack of elasticity of the pleura. To prevent the access of pus to these patulous stitch holes, from six to eight interrupted catgut sutures are introduced along the course of the previous

suture line, each suture comprising the costal and diaphragmatic pleuræ, together with the diaphragm. These sutures are not tied. A narrow strip of iodoform gauze is now placed so as to cover the continuous suture, this strip to lie at the same time within the open ends of the interrupted sutures. The interrupted sutures are now closed over the gauze strip, holding it firmly down against the continuous suture, which they will very effectually protect against soiling by pus.

(c) Isolation of the peritoneal cavity. The pleura and diaphragm being incised within the circle of protective sutures, the abscess may be immediately opened, provided that it be subdiaphragmatic. If it be a hepatic abscess, it may also be incised at once, if the under surface of the diaphragm is adherent to the dome of the liver. If not, the place of incision must be isolated from the rest of the peritoneal cavity by a circular packing of iodoform gauze.

(d) Incision and drainage of the abscess. This step is carried out according to the well-known method of first aspirating, then entering the abscess with a grooved director passed in along the hollow needle. The needle being withdrawn, a slender dressing forceps is passed down the groove of the director, and, being well opened, is withdrawn, thus dilating the channel by stretching. Through this wide channel one or two large drainage tubes are introduced. It may be said that the pleural cavity was admirably protected by this device in all of our six cases.

A brief extract from the histories of the fatal cases is hereby appended:

1901, vol. iii., page 154. *Diffuse Purulent Peritonitis, caused by Perforation of a Liver Abscess; Operation; Death.*—Eli H., 50 years of age, was admitted to the hospital on November 13 with the following history: Previous history negative, with the exception of an attack of jaundice which occurred about thirty years ago. Patient stated that his present illness had lasted eleven days, beginning with chilly sensations and fever; that he had had pain in the right iliac fossa during the past seven days. Bowels have been constipated, but responded to enemata.

On examination it was found that the abdomen was so much distended and tympanitic that an exact palpation was impossible. In anesthesia a mass was felt on the right side below the border of the ribs. Temperature 101°, pulse 112, respiration 28.

Operation November 15. The greatest tenderness being located over the appendix, the incision was made in this region. Thick, creamy pus in large quantities was found in the free peritoneal cavity, filling up all recesses behind the colon, and in the pelvis, covering also the in-

testines where they were not matted together. Search for the appendix was unsuccessful; lengthy and continued exploration of the other viscera was contraindicated by the wretched condition of the patient. A counter incision for better drainage was made in the loin.

Patient reacted very poorly after the operation, and died about ten hours later.

At autopsy there was found a diffuse purulent peritonitis; in the right hypochondrium a large abscess cavity, which communicated with a perforated abscess of the liver substance.

1901, vol. iii., page 156. *Multiple Abscesses of the Liver; Several Transpleural and Transperitoneal Hepatotomies, the final one with Resection of a Portion of the Liver; Death due to Sepsis from Additional Undrained Abscesses.*—Mendl S., 42 years of age, was admitted to the medical service of the hospital. Past history: "A long time ago" had an attack of jaundice accompanied by abdominal pain. Present history: Patient has complained for eight days of weakness, loss of appetite, constipation, and pain in the right half of the abdomen. Physical examination revealed an enlargement of the liver, compression symptoms of the lungs, and friction sounds of the pleura. Examination of the blood showed a leucocytosis of 21,690. Temperature 103.8°, pulse 86. On aspiration pus was found, and patient was transferred to the surgical service.

Operation on August 18, following the method previously described. About four and a half inches of the eighth and ninth ribs were resected in the midaxillary line. The pus evacuated was exceedingly thick, ropy, and tenacious, and on this account its evacuation was difficult.

Though there was no infection of the pleura, the temperature remained high, and the pus so thick that it absolutely clogged the drainage tubes. An attempt was made to withdraw the pus by the suction of a siphonage apparatus according to Sprengl. This also proved ineffectual.

A second operation was done August 31. Incision below the free border of the ribs. The peritoneum was found to be adherent. After dividing about one and a half inches of liver tissue with the Paquelin cautery, the abscess cavity was reached and through-and-through drainage was established.

Following this operation there was considerable improvement in the general condition of the patient, large amounts of thick, viscous pus and necrotic tissue being cast off. After a short-lived improvement patient began to lose ground again and septic temperatures were permanent. As a last resort it was decided to subject the patient to another operation, its object being free exposure of the cavity. This final operation was done September 20.

The anterior and posterior wounds were connected by an incision which ran perpendicularly to the direction of the ribs. The eighth and ninth costal cartilages were resected. All the tissues covering

the liver were found to be adherent. The intervening liver tissue, about one and a half inches square, was extirpated by means of the thermocautery, and thus the abscess cavity was exposed. Much thick, tenacious pus was found adherent to the necrotic surface of the cavity. This having been washed and sponged away, the surface was found to be pitted with small pockets of pus, some of which extended inward to a depth of from a half to one inch. All these pockets were curetted. At the upper portion of the wound a large amount of necrotic tissue was found. On removing this a narrow sinus was laid bare. The cutaneous incision being extended upward (better to expose this sinus), the exploring finger entered into another pus cavity which was situated in the uppermost region of the liver. This cavity was emptied and drained. The entire abscess wall was lightly cauterized with the Paquelin. Drainage by a Mikulicz tampon.

In spite of this radical procedure patient continued to lose ground. The symptoms of septic absorption remained unchanged, and patient succumbed on September 30.

At autopsy two additional large and undrained abscesses were found in the liver.

1901, vol. iii., page 157. *Multiple Abscesses of the Liver; Operation (Transpleural Hepatotomy); Death from Sepsis.*—Jacob F., 30 years of age, was admitted to the medical service of the hospital on August 2 with the following history: For the past year patient has been complaining of pain in the abdomen and of general weakness. For three weeks he has been confined to bed. On examination there was found an extremely emaciated individual, with a much-enlarged liver which was painful on pressure. On aspiration pus was found, and patient was transferred to the surgical service.

Operation on August 7. Incision in the axillary line according to the method previously described. The abscess was situated at great depth.

To tide him over the shock persisting during the first twenty-four hours, the patient needed energetic stimulation. In spite of the profuse discharge, and of the casting-off of large pieces of necrotic tissue, the temperature continued high. A number of other abscesses formed and were opened, drainage taking place through the primary incision. However, the patient continued to lose ground, and died of sepsis August 20. His three last days of life were marked by a profuse and fetid diarrhea.

At autopsy there was found an uncountable number of small and large abscesses scattered throughout the entire liver; one large (probably amebic) ulcer in the cecum, and innumerable small ulcers of recent origin were found distributed through the entire colon. The pleura was absolutely clean at the site of the operation.

1901, vol. iii., page 158. *Multiple Abscesses of the Liver; Operation (Transperitoneal Hepatotomy); Death.*—Hirsch H., 47 years of age,

was transferred from the medical to the surgical service on April 5 with the probable diagnosis of abscess of the liver. The past history, with the exception of moderate alcoholism, is negative. Five weeks ago patient had an attack of influenza, and was apparently recovering when he was seized with very sharp pains in the right side of the chest; these pains continued with increased severity, and were accompanied by chills and fever.

On examination it was found that the right lobe of the liver was very much enlarged and both painful and tender. Pleural and peritoneal friction sounds were distinctly audible over this portion of the liver. Aspiration yielded a chocolate-colored pus.

The operation consisted of a transperitoneal hepatotomy. This revealed that the abscess occupied a very high position, requiring the resection of the lowest ribs.

The post-operative course was similar to that of the preceding history. Other abscesses were evacuated through the abscess first opened. Later on pleurisy developed, requiring aspiration, 37 ounces of a bloody serum being withdrawn. No abatement of the high fever took place. A subphrenic abscess was suspected, and repeatedly searched for with the aspirator in vain. Patient died on May 19.

No autopsy was permitted.

SUBDIAPHRAGMATIC ABSCESS.

Two cases of subdiaphragmatic abscess required for their ultimate cure repeated thoracoplastic operations, which will be reported in the part dealing with the surgery of the thorax.

SYPHILIS OF THE LIVER. TOTAL, 2; DEATH, 1.
CARCINOMA OF THE LIVER. TOTAL, 2; DEATHS, 0.
ACTINOMYCOSIS OF THE LIVER. TOTAL, 1; DEATH, 1.
ECHINOCOCCUS CYST OF LIVER AND LUNG. TOTAL, 1; DEATH, 1.

A brief extract of the histories of these cases is appended. It will be seen that in the case of syphilitic disease of the liver, for which exploratory laparotomy was performed, death was caused by pulmonary edema. The cases of actinomycosis and of echinococcus cyst of the liver are of sufficient interest to deserve a detailed account.

1901, vol. iii., page 159. *Syphilis of Liver; Operation (Exploratory Laparotomy); Death from Pulmonary Edema.*—Max B., 42 years of age, was admitted to the hospital on August 15 with the following history: Patient had a chancre twenty-two years ago, but gave no history of the secondary manifestations of syphilis. The onset of present illness dates back about three weeks. It was very acute in the beginning, causing vomiting, pain in the epigastrium, very obstinate constipation, and general peritoneal irritation. On examination

there was found in the right hypochondrium a very firm, smooth mass holding close relations with the liver, suggesting a distended gall bladder.

At the exploratory laparotomy on August 16, the mass revealed itself as a syphiloma of the liver. As already stated, the patient died on the same day in an attack of pulmonary edema.

1901, vol. iii., page 161. *Actinomycosis of Liver and Lungs; Operation (Exploratory Laparotomy; Hepatotomy); Death.*—Adolph G., 34 years of age, was admitted to the hospital on March 19 with the following history: Patient had had three attacks of appendicitis. After the last attack, eight months ago, he was operated upon at one of the hospitals of the city. One month later a rectal abscess was incised and drained. Present illness dates back six months, and manifested itself by irregular chills and fever, vomiting, and occasional attacks of jaundice. On examination it was found that the liver was uniformly enlarged. It was not particularly painful or tender, except at a circumscribed spot between the anterior axillary and mammary line, just below the free border of the ribs. Aspiration gave a negative result. On admission the temperature was only 100.4°, but within a few hours patient had a chill, the temperature rising to 104°. Similar chills followed daily at irregular intervals, the temperature once rising to 106.2°. Repeated and careful blood examinations for malarial plasmodia yielded no positive result. In view of the desperate condition of the patient, an exploratory laparotomy was decided upon, and performed on March 22.

On opening the peritoneum, and after separating numerous adhesions, a very firm mass was found occupying the anterior and under surface of the liver, close to the outer side of the gall bladder. This mass was of a yellowish color, very friable, and was evidently undergoing necrobiosis. Part of the mass was excised for subsequent pathological examination; the rest was curetted away. With suitable drainage, partial closure of the wound.

The operation had absolutely no effect in ameliorating the condition of the patient. He continued in the same septic state as before the operation, and died on April 1.

At autopsy two large actinomycotic areas were found in the liver and several small actinomycotic foci in both lungs.

1900, vol. i., page 28. *Echinococcus Cyst of Liver and Lungs; Operation (Transpleural Hepatotomy and Drainage); Death.*—Morris M., 57 years of age, was admitted to the medical division of the hospital on October 16, 1900. Past history is too indefinite to be of any value. Present illness of four weeks' standing, beginning with pain in the upper part of the abdomen, especially to the left of the umbilicus. This pain was so constant as to cause absolute insomnia. Jaundice appeared three weeks ago, and was, according to the patient's

statement, on the increase. Bowels constipated, stools clay-colored. Since the onset of the disease patient had had two chills.

On admission, physical examination showed the following points: Lungs: Dulness, extending from the spine of the left scapula to the base; diminished voice, fremitus, and breathing. Liver extends three fingers' breadth below the free border of the ribs; the left lobe extends nearly to the umbilicus.

During his stay on the internal service the following facts were noted:

October 18: Echinococcus cysts found in the stools.

October 20: Left pleural cavity aspirated, one drachm of an amber-colored, viscid, highly albuminous fluid withdrawn.

October 31: Liver has decreased materially in size.

November 1: Development of a double otitis media, necessitating paracentesis on the right side. During all this time the temperature has ranged between 98.4° and 102.6°.

November 7: Patient was transferred to the surgical service. Operation the same day. On account of the poor general condition, cocaine anesthesia was employed. The incision was made over the ninth rib, and three inches of it were resected in the posterior axillary line. The costal pleura was opened, and found to be adherent to the visceral pleura, but no free fluid was found. Aspiration directly inward withdrew a turbid, straw-colored fluid containing flakes. The course of the aspirating needle was then dilated with dressing forceps, and about a pint of this fluid was withdrawn. It was found to emanate from a large cavity, apparently in the lung itself, reaching a considerable distance downward, also upward toward the apex. This cavity was irrigated, and drained by tubes and gauze.

Subsequent to the operation there was no change in the general condition, nor did the wound offer anything of note. Beginning November 14, and until death, profuse diarrhea prevailed. For a while the general condition improved so far that patient was up and out of bed. December 6, patient complained unceasingly of chilliness; temperature rose to 101.4° and pulse to 112. On December 7, without any warning, and without any exertion having preceded it, patient suddenly expired.

No autopsy permitted.

CIRRHOSIS OF THE LIVER. TOTAL, 1; DEATH, 1.

1900, vol. i., page 27. *Atrophic Cirrhosis of Liver; Operation (Omento-Fixation); Death.*—Joseph M., 49 years of age, was admitted to the hospital on November 20, 1900. In the past history there was to be noted an excessive use of alcohol, a moderate tobacco habit, and an absence of a syphilitic infection. Patient had had for a number of years repeated attacks of gastritis, accompanied by nausea and vomiting.

His present illness dates back only about two weeks, and was acute in its onset, beginning with a chill and accompanied by fever. It was characterized by vomiting, the vomitus containing blood. About this

time the abdomen began to be swollen, and patient began to have dyspnea, even on slight exertion. The urine was diminished, and contained albumin, but no casts.

On examination physical signs and symptoms characteristic of an advanced cirrhosis of the liver were found. The omentum was pale and edematous. Hobnail liver, moderately enlarged. Its surface was scarified with the scalpel, and then, with a continuous chromicized catgut suture, the omentum was sutured to the anterior abdominal wall. Closure of the abdominal incision, without drainage.

For a while the condition of the patient was satisfactory. The amount of urine, though somewhat greater than before the operation, was still scanty, and the dropsy began to reappear. On November 28, five days after the operation, patient vomited about two quarts of clotted blood. The temperature rose from the normal to 101.4°. One hundred and fourteen ounces of a sanguineous fluid were withdrawn by paracentesis. The following day bloody vomit and profuse diarrhea, the stools being mixed with blood. December 1, patient became progressively weaker, suddenly went into collapse, and died.

At autopsy following condition was found: *Lungs:* Negative. *Heart:* Negative. *Kidneys:* Chronic diffuse nephritis of slight degree. *Spleen* enlarged to half again its normal size; firm, congested, with marked increase in the connective tissue. *Liver* smaller than normal, hobnail in character, very hard and firm; parenchyma almost entirely replaced by connective tissue. *Intestines:* Small intestines contained some fresh blood; vessels of ileum congested. Large intestines also contained blood, but no erosions were visible anywhere. *Stomach*: Congested. *Esophagus*: Varicosities at cardiac end. *Pancreas* showed interstitial pancreatitis of slight degree. *Peritoneum:* The omentum is sewed to the anterior abdominal wall by suture; no adhesions. Considerable ascites.

DISEASES OF THE GALL BLADDER AND BILE DUCTS. TOTAL, 22; DEATHS, 5

	Total.	Cured.	Improved.	Unimproved.	Died.
Cholecystitis	5	..	1	3	1
" gangrenous	1	..	..	..	1
Pericholecystitis	1	..	1	..	..
Cholelithiasis	2	..	1	1	..
" with gangrenous cholecystitis	3	3	..	..	..
" stones in gall bladder	3	1	..	..	2
" " " " " and cystic duct	2	2	..	..	..
Cholelithiasis; stones in gall bladder and common duct	1	1	..	..	..
Cholelithiasis; stone impacted in common duct	2	2	..	..	..
Cholangitis, infectious; typhoid fever and paracolon infection	1	..	..	..	1
Carcinoma of gall bladder	1	..	..	1	.

Operations on the Gall Bladder and Biliary Ducts. Total, 14; Deaths, 5.

	Total.	Deaths.
Cholecystostomy	10	3
Choledochotomy	1	..
Cholecystostomy and unilateral salpingo-oöphorectomy	1	1
" " choledochotomy	1	..
Exploratory laparotomy for cholangitis	1	1

It is readily seen, in the above statistical table, that there exists a flaw in the diagnosis of some of our cases of gall-bladder disease; reference is made here to such vague terms as cholecystitis or cholelithiasis. This is due to the fact that while an exact anatomical diagnosis is aimed at in most cases, and subsequently verified at the operation, this verification has been impossible in a certain number of cases, because operative interference was declined either by the surgeon or by the patient. In one instance only was no definite cause of cholecystitis found at the time of the operation.

If we except the case of infectious cholangitis (1901, vol. iii., page 180) and the case of carcinoma of the gall bladder (1901, vol. iii., page 181), there remain 20 cases of gall-bladder disease, so-called, which were under treatment during the year 1901. Of these 20 cases 4 cases ended fatally—a mortality of 20 per cent. While this represents a high rate of mortality, this will become still more unfavorable by excluding those cases which received no surgical treatment. Of the 20 cases, 7 were not operated upon, and in justice these 7 cases must be excluded from our operative statistics. After the correction we get four deaths following thirteen operations, or a mortality of 30.76 per cent. The question may be asked, why this high mortality?

Competent writers have repeatedly called attention to the close symptomatic resemblance existing in many respects between gall bladder and appendicular inflammation. Considering that both the appendix and the gall bladder represent blind sacs lined with mucous membrane and covered with peritoneum, both being more or less freely movable within the peritoneal cavity, the cavities of both exposed to infection proceeding from the gut—considering all these facts, the symptomatic parallelism is very natural. But this parallelism may be said to exist regarding the indications, prognosis, and rate of mortality also.

As repeatedly explained in previous reports, the high rate of mortality in appendicitis was mainly due to the fact that the cases were either unrecognized or neglected, and came too late to the hospital for

treatment, *i.e.*, at a time when the patients were suffering from fatal complications. With advancing years, a better recognition of the disease, and with a wider knowledge of the malady, the patients were referred to the hospital in much better condition. The outcome was an improvement in the prognosis and a decidedly diminished rate of mortality. We express the firm conviction that when these facts come to be more and more appreciated, the mortality of gall-bladder disease will also be much diminished.

No change was made in the operative technique followed in the First Surgical Division of the hospital.

Below will be found a brief report of those cases which ended lethally; also the histories of some of the cases which terminated in recovery, this particular attention being accorded to them on account of exceptionally interesting features or of complications of an unusual character.

1901, vol. iii., page 167. *Cholecystitis; Operation (Cholecystostomy); Death.*—Salie R., 40 years of age, was admitted to the hospital on October 1. Past history is negative, while the present history is too indefinite to be of great value. Its principal points are: Onset three months ago with vomiting, headache, and pain in the right hypochondriac region; jaundice during the past three months, and confinement to bed for the past month.

On examination, in addition to the jaundice, there was found an enlarged and painful liver; the gall bladder was not palpable, on account of the distension of the abdomen. The urine contained much bile. Temperature 97°, pulse 80, respiration 24.

Operation on October 4. In anesthesia, a tumor, the size of a large fist, was to be palpated in the region of the gall bladder. Incision through the right rectus muscle. On opening the abdomen, there presented in the wound an unusually long right lobe of the liver, and a distended gall bladder about the size of a large fist. After having protected the abdominal viscera by packings, the gall bladder was aspirated and its contents evacuated. No stones being felt in the gall bladder, systematic exploration of the ducts was proceeded with, but with a negative result. This step was exceedingly difficult, on account of very dense adhesions. A number of enlarged glands were palpated in close proximity to the common duct, but no stone was found.

As it was impossible to deligate, at the great depth, the numerous bleeding points, these parts were packed with iodoform gauze. Drainage of the gall bladder; partial closure of the abdominal wound.

In the subsequent course there was not the slightest irritation of the peritoneum noted. On the fourth day after the operation the tampons were changed, but this was followed in the evening by

slight oozing, requiring firmer packing. A more alarming symptom, however, arose in the form of copious hematemesis; this recurred on the following day, after which occurrence the pulse began to fail. In spite of active stimulation, patient expired on the same day.

Only a limited autopsy could be held. No trace of peritonitis, and no stones were found in either gall bladder or ducts.

1901, vol. iii., page 170. *Gangrenous Cholecystitis; Chronic Appendicitis; Diffuse Peritonitis; Operation (Cholecystostomy, Appendicectomy); Death from Sepsis.*—Joseph W., 25 years of age, was admitted to the hospital on March 25 with following history: Patient, who had never been sick before, was suddenly taken ill three days ago with general and severe pain in the right hypochondrium and epigastrium. At present it had become localized in the right iliac fossa. Enemata produced no movement of the bowels, while all internal medication led to vomiting.

Physical examination showed considerable rigidity over the entire abdomen, and tenderness over the entire right side, particularly below the free border of the ribs. Liver was enlarged. On account of the rigidity of the abdomen, examination unsatisfactory. Temperature 102°, pulse 118, respiration 28.

Immediate operation. Incision along the outer border of the right rectus. The appendix was found in a state of chronic inflammation. It was removed. This, however, did not explain the serious condition of the patient. On further exploration another mass was found in the region of the gall bladder. The incision was extended upward, and thus the distended gall bladder was exposed. It was isolated by packings and aspirated, several ounces of a bloody, biliary fluid being withdrawn. A small incision was made into the gall bladder, but no stone was found; a drainage tube was inserted, and the wound was closed in its lower portion.

Patient took the anesthetic very badly; was continuously cyanotic; pulse was very poor and very rapid, 150 to 170, and required considerable stimulation.

Patient left the table in a very bad condition, and never rallied from the shock of the operation; he died about four hours later.

At autopsy the following conditions were found: *Lungs* showed edema. *Liver:* Somewhat enlarged. *Spleen:* Septic. *Gall bladder:* Walls much thickened; mucous membrane gangrenous throughout; ducts patent.

Epicrisis.—This is another of the cases which offer considerable difficulty in making the differential diagnosis between appendicitis and cholecystitis.

1901, vol. iii., page 173a. *Cholelithiasis; Biliary Cirrhosis of Liver; Operation (Cholecystostomy); Death from Pneumonia.*—Mary G., 70 years of age, was admitted to the hospital on March 31

with the following history: Patient had her first attack of jaundice twenty years ago. She has been having, during the past seven years, attacks of pain and jaundice every two to four weeks, the duration of these attacks being about two weeks. Lately these attacks were so frequent and severe as to make life unbearable.

On examination the following status was found: Patient markedly emaciated. Skin and conjunctivæ deeply icteric. Lungs emphysematous. The liver extending from the sixth rib downward to half an inch below the umbilicus. It was nodular and hard. At the lower margin of the liver there was a hard mass which was both painful to touch and tender. The urine contained a large amount of bile, as well as albumin and casts.

Operation on April 1. Incision through the right rectus muscle, extended much lower than usual. On opening the abdomen the liver was found to be much enlarged, deeply bile-stained; its surface nodular (hobnailed). It was very difficult to find the gall bladder. Very deeply, and covered by omentum and a mass of adhesions, a mass could be felt, of the size of a large fist, and literally of a stony hardness. On separating the adhesions and resecting portions of adherent omentum, the gall bladder was exposed, containing apparently one huge stone. On incising the gall bladder the stone (fully the size of a duck's egg) was exposed. To deliver it, it had to be cut in two with bone forceps. Several smaller stones, up to the size of a walnut, were also removed from the cystic duct. A probe was passed into the common duct, which was found to be free. Introduction of a drainage tube; partial closure of the abdominal incision.

The subsequent course, notwithstanding the magnitude of the operation, was at first very encouraging. Only once did the temperature rise to 101°, on the second day. Dressings were changed on the fifth day, and everything about the wound was doing well. On the seventh day, however, the temperature rose abruptly from 98.6° to 102.4° and the pulse rate from 88 to 112; the cause of this was a typical lobar pneumonia involving the lower lobes of both lungs; and patient died twenty-four hours later.

Autopsy.—Heart: Fatty infiltration. *Left lung:* Lower lobe consolidated. *Right lung:* Lower lobe in stage of gray hepatization. *Gall bladder:* Enlarged, and thickened walls; one stone found in a diverticulum; common duct materially dilated. *Liver:* As previously described. *Kidneys:* Chronic nephritis.

Epicrisis.—This patient was observed, by a member of the attending staff, for a very long time prior to her admission to the hospital. Operation, while considered, was continually deprecated on account of the poor general condition of the patient. Finally her sufferings became so severe that operative interference was consented to by the surgeon.

Another remarkable fact about the case was the huge size of the stone.

1901, vol. iii., page 174. *Cholelithiasis; Cholecystitis; Carcinoma of Right Ovary; Operation (Cholecystostomy, Salpingo-oöphorectomy); Death.*—Sarah R., 40 years of age, was admitted to the hospital on August 20 with following history: With the exception of a single attack of jaundice six weeks seven years ago, patient was perfectly well up to eight weeks ago. Since that time she has complained of increasing weakness, loss of appetite, of flesh and strength; in addition there is also continuous pain in the right hypochondrium and right iliac region. Vomiting almost regular after the ingestion of food, occasionally occurring also between meals.

On examination there was found an enlargement of the liver; below the liver, in the right side of the abdomen, there was a mass approximately two and one-half inches wide and three inches long; the upper part of this mass was smooth, the lower distinctly hard, almost stony, and nodular. This mass moved freely with respiration, and also had considerable lateral mobility; it was somewhat tender on pressure, and could be readily differentiated from the overhanging liver. Vaginally a globular, slightly tender, freely movable mass was to be felt in the right fornix. Skin and scleræ were deeply icteric. Urine contained large amounts of bile.

A preliminary diagnosis of a movable kidney and of an enlarged Riedel lobe was made. Patient was kept under careful observation, and, none of the symptoms showing any amelioration, an obstructive jaundice was assumed and patient operated upon.

Operation August 23. Incision on the outer border of the right rectus, at the level of the previously described mass. On opening the abdomen a pear-shaped tumor presented at once in the wound; this tumor was recognized as the distended gall bladder containing calculi. The gall bladder rested upon the enlarged and prolapsed kidney. The hand was introduced into the pelvis, in order to examine the mass which was felt vaginally before operation. This mass was brought into the wound, and, being taken for a cystic ovary, was replaced. A cholecystostomy was performed in the usual manner; two large calculi were removed. Before closing the wound some hemorrhage was found to be going on in the pelvis; the ovarian tumor was consequently again brought to view, when an active hemorrhage was found to be going on from a rent in its peritoneal coat. This tumor, after deligation with a stout silk ligature, was extirpated. Partial closure of the abdominal incision.

Microscopical examination showed the ovarian tumor to be a carcinoma.

The subsequent course was marred by a pyocyaneus infection and by an intercurrent pneumonia. These local infections were combated, in time, by appropriate treatment. However, the general

condition began to fail, and patient steadily lost ground, a condition of chronic sepsis developing.

Patient died in this condition on September 14.

No autopsy was permitted.

The case about to be described is presented in detail on account of the highly interesting condition found during the operation, which presented unusual difficulties in the operative procedures undertaken.

1901, vol. iii., page 176. *Cholelithiasis (stones in the gall bladder, impacted stone in the common duct): Operation (Cholecystostomy, Choledochotomy): Recovery.*—Fannie L., 40 years of age, was admitted to the hospital on April 18 with following history: The onset of the present illness is dated about eight months back, when she began to have attacks of abdominal pain, localized in the epigastric

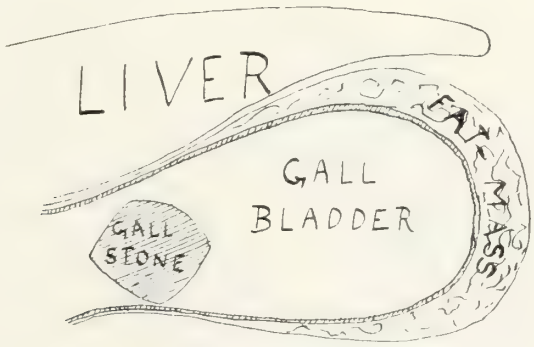


FIG. 2.

and right hypochondriac regions, accompanied by jaundice; these attacks have occurred at intervals of five to six weeks; the more recent attacks were also accompanied by chills and fever; last attack six days ago. Considerable loss of flesh and strength.

On examination there was found a marked icterus of the skin and scleræ. The abdomen was tender, particularly in the right hypochondrium, where a very tender mass (gall bladder) could be felt. Liver enlarged.

Operation on April 19. An oblique incision, five inches long, following the free border of the ribs, was made, exposing the slightly enlarged liver and distended gall bladder, which was felt to contain a stone. A stone was also felt in the common duct. The fundus of the gall bladder was thickened and contained a deposit of fat in its wall. The kidney was enlarged and displaced downward.

The gall bladder was isolated from the rest of the abdominal contents by means of packings, and its fundus incised. A small

quantity of colorless mucus escaped, and there was also removed from the cystic duct a faceted stone (Fig. 2). Another stone could be felt in the common duct, in close proximity to an enlarged and hard lymphatic gland, and lying surrounded by a vein, and very close to an artery, which could be felt distinctly to pulsate. The stone could not be manipulated into the gall bladder or duodenum, hence a semicircular incision was carefully made into the common duct, closely hugging the vein. This opening was dilated with dressing forceps, liberating a quantity of limpid bile. Then the stone, with facets similar to those on the stone from the cystic duct, was removed with a scoop (Fig. 3).

An attempt was then made to close the common duct by sutures, but the second suture perforated an artery, causing considerable hemorrhage; in the attempts to pass a ligature around the artery

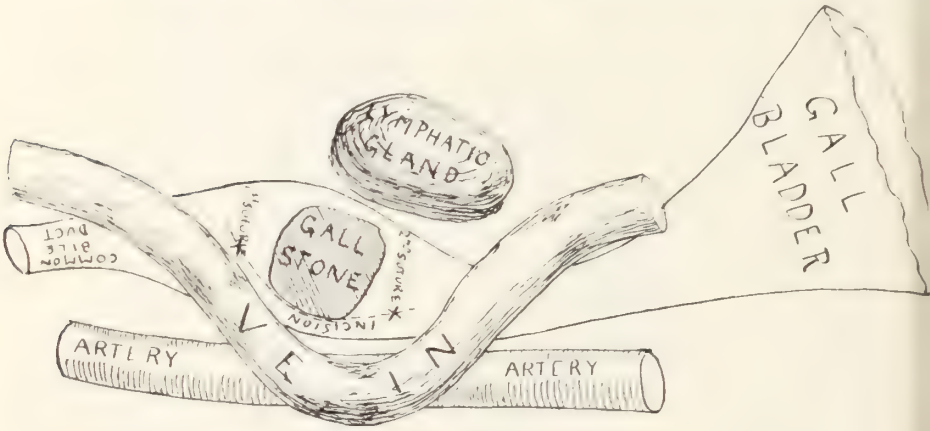


FIG. 3

the hemorrhage started anew, so that the artery had to be pinched on itself and deligated. Suture of the duct had to be abandoned. The first suture was removed and a rubber drainage tube was inserted into the duct. It was retained in place by surrounding it with iodoform gauze. Tube drainage of the gall bladder. Partial closure of the abdominal incision.

The subsequent course was practically uneventful. Both drainage tubes were removed on April 30, and patient was discharged, cured, on May 12.

CHOLANGITIS; TYPHOID AND PARACOLON INFECTION. TOTAL, 1; DEATH, 1.

1901, vol. iii., page 180. *Cholangitis; Typhoid and Paracolon Infection; Operation (Exploratory Laparotomy); Death from Bacteremia.*—Charles L., 33 years of age, was admitted to the hospital

on August 31 with following history: Family and past history is negative. The onset of the present illness, ten days ago, was acute in its beginning, and commenced with nausea, vomiting, and a feeling of general malaise; considerable abdominal distension and marked epigastric pain. During the attack patient remained in bed for two days, but even after the subsidence of the acuter symptoms patient did not feel well. Three days ago patient was again seized with severe pain, colicky in character, and distinctly localized in the epigastrium, radiating to the back; has vomited twice and had a mouth temperature of 104.2°. On the following morning the temperature fell to 101°, but in the evening it rose again to 103°.

On admission, following status, of bearing upon the case, was found: The skin subicteric. The abdomen rigid, particularly in the right half; the liver was enlarged; in the right hypochondrium a very tender and painful mass, about the size of a lemon, was found. The spleen was not enlarged, nor were there any other symptoms pointing to typhoid fever present. The probable diagnosis of cholecystitis or abscess of the liver was made, and operation decided upon. The urine contained albumin and hyaline and granular casts. Temperature 105.4°, pulse 112, respiration 26.

Operation September 1. Incision about four inches long, beginning at the ribs, made over the right rectus. On opening the peritoneum no free fluid was found. The exploring finger discovered a Riedel lobe of the liver, which was the mass felt before the operation. The gall bladder was fairly distended, and its contents could not be pressed out through the ducts into the duodenum; the cystic and common ducts were palpated and found to be free from stones; no other cause for the obstruction was found.

On the surface of the Riedel lobe there was some inflammatory fibrin, and just above the middle of the free border of the liver there was a small, white, round spot about 3 mm. in diameter; this was neither elevated nor depressed, and was taken to be a tubercle; it was excised, after passing a hemostatic suture around it, and preserved for future examination. (On examination it was found to be merely inflammatory exudate.)

The gall bladder was now isolated from the rest of the peritoneal cavity and aspirated; normal bile was obtained; the puncture was closed by purse-string sutures. The liver substance was aspirated in several directions, but no pus was obtained; nor were there any areas of induration to be palpated in the liver. Partial closure of the abdominal incision.

The subsequent course in the beginning was practically negative, as far as it influenced the condition of the patient.

On September 3 the culture taken from the bile at the time of the operation was reported as showing a colon bacillus. Widal reaction was negative. Temperature between 102.4° and 104.6°.

On September 4 following condition was noted: General condition less good; apathy increasing; jaundice more marked; liver more

enlarged. Temperature between 103.6 and 105. Blood culture taken.

On September 5 the liver was again aspirated in the ninth space, axillary line, but with a negative result. The temperature rose to 106. In other respects the condition was unchanged.

On September 7 the blood culture taken on September 4 was reported as positive, containing a paracolon bacillus. General condition unchanged; if anything, deteriorating.

On September 8 a positive Widal reaction was reported in a dilution of 1 to 200. Blood examination showed following figures: Red blood cells, 2,720,000; white blood cells, 10,700; hemoglobin, 50 per cent.

On September 9 a blood count showed 48,000 white cells; a differential count gave following values: Polynuclear neutrophiles, 84 per cent.; small mononuclear cells, 10 per cent.; large mononuclear cells, 5 per cent.; eosinophiles, 1 per cent.

From September 7 to September 10 patient continued jaundiced and conscious, but markedly apathetic. Vomiting almost incessant, and involuntary urination and defecation. Besides active stimulation, patient received almost continuous cold packs, which, however, had but little effect in the reduction of the temperature. Pulse grew progressively weaker, and finally patient expired on September 10.

Autopsy showed a parenchymatous degeneration of all the organs and chronic congestion of all the viscera. In the intestines typhoid ulcerations, some healed, and some in the process of healing.

Epicrisis.— The pathological and bacteriological features of this case are of very great importance and interest. Full data will be found in an article published by Dr. A. A. Berg and Dr. E. Libman in the *Annals of Surgery* for 1902.

DISEASES OF THE FEMALE GENITAL TRACT. TOTAL, 13; DEATHS, 2.

	Total.	Cured.	Improved.	Unimproved.	Died.
Acute salpingo-oöphoritis	2	..	2	..	..
" " " and appendicitis	2	2	..	..	..
" " " " " and diffuse peritonitis	1	..	..	..	1
Chronic salpingo-oöphoritis	3	1	2	..	..
" " " (gonorrheal)	1	1	..	..	..
Ruptured extrauterine pregnancy	1	1	..	..	..
Incarcerated fibroids of uterus with diffuse peritonitis	1	..	..	..	1
Benign ulcer of cervix	1	1	..	..	..
Vesicovaginal fistula	1	1	..	..	..

Operations on the Female Genital Tract. Total, 9; Deaths, 2.

	Total.	Died.
Amputation of cervix	1	..
Plastic operation for vesicovaginal fistula	1	..
Myomectomy for incarcerated uterine fibroids	1	1
Salpingo-oöphorectomy for extrauterine pregnancy (ruptured)	1	..
" " (double) for gonorrheal salpingo-oöphoritis	1	..
" " " " double salpingitis	1	..
" " and appendicectomy for pyosalpinx and appendicitis	3	1

There is a separate gynecological service in the hospital. The cases enumerated above were either private patients or were patients admitted to the hospital without a definite diagnosis.

The histories of the two fatal cases are as follows:

1901, vol. iii., page 235. *Acute Salpingo-oöphoritis; Ovarian Cyst; Appendicitis by Continuity; Diffuse Peritonitis; Operation (Salpingo-oöphorectomy; Appendicectomy); Death.*—Annie M., 24 years of age, was admitted to the hospital on May 23. Family and past history negative. Patient aborted three weeks ago at the end of the second month of pregnancy. Then curettage was done. She was perfectly well up to three days ago, when she was suddenly taken ill with a chill, fever, vomiting, and general abdominal pain.

On admission, notwithstanding the rigidity of the abdomen, an appreciable mass could be felt in the right iliac fossa. Vaginally also a mass was to be felt, apparently continuous with the mass in the abdomen. Cervix widely lacerated. Temperature 102.4°, pulse 128, respiration 24.

Immediate operation. Incision along the outer border of the right rectus. On opening the peritoneal cavity a quantity of purulent fluid welled out. After the insertion of gauze packings, the previously described mass was incised and a large quantity of non-odorous pus evacuated. The tube and ovary were then isolated, and, after ligature, extirpated. The appendix was also found to be involved and was similarly dealt with. Partial closure of the wound after suitable drainage.

Autopsy of the removed organs.—The tube was much enlarged and thickened; the ovary contained a ruptured cyst, the size of a walnut, with hemorrhagic walls; the appendix was four inches long, markedly injected, its mucosa ulcerated.

It was assumed that the infection had extended through the right tube into the peritoneal cavity, there establishing a purulent peritonitis, involving the appendix by continuity.

On the following day the condition of the patient became very poor. The temperature ranged between 102.4° and 103.6°, the pulse between 110 and 128, requiring considerable stimulation. During the following days the patient was in a condition of systemic sepsis, in consequence of which she died on May 27.

At autopsy the following pathological lesions were found: Chronic diffuse nephritis; cirrhosis of the liver; in the peritoneal cavity about 500 c.c. of a seropurulent fluid; intestines congested and in parts covered with fibrin; mesenteric nodes enlarged.

1901, vol. iii., page 236. *Incarcerated Fibroids of Uterus; Diffuse Peritonitis; Operation (Myomectomy); Death.* Anna R., 51 years of age, was admitted to the hospital on August 1 with following history: Menopause three years ago; in other respects menstrual history negative. Four months ago, while abroad, patient had an acute attack of abdominal pain, localized in the right iliac fossa, accompanied by fever and general prostration. The duration of the present illness dates back four days; its onset was characterized by very acute pains in the back and in the abdomen. These pains finally became localized in the right iliac fossa. There was no chill, nor vomiting; bowels had moved slightly by repeated enemata.

Prior to admission patient was seen by a member of the attending staff, who found a distinct mass, the size of a large fist, in the right iliac fossa. This mass was exceedingly tender to pressure, immovable, and extending above a line drawn from the anterior superior spine of the ilium to the umbilicus. The whole abdomen was tense and rigid, with marked tenderness in the right iliac fossa. Vaginal examination revealed a continuation of above-described mass into the pelvis. Examination was very unsatisfactory on account of the extreme obesity. Temperature 103.6°, pulse 120.

Immediate operation. Incision about 6 inches long on the outer border of the right rectus, so as to bisect a line drawn from the anterior superior spine of the ilium to the umbilicus. After division of the skin and an enormous panniculus, the sheath of the rectus was opened, the muscle was retracted inward, and the peritoneum opened. The palpating finger discovered a mass in the right iliac fossa, which at first was taken to be an appendicular abscess, and packings were inserted so as to isolate this mass. When this was accomplished it was seen that the mass had no connection with the colon, but that it took its origin from the pelvis. The mass was firmly embedded, so that it was impossible to raise it from the pelvis. Its inner half was adherent to a large mass of hypertrophied omentum, recent and old adhesions covering its anterior, upper, and inner surfaces. Further examination revealed the presence of other very firm, hard masses, connected with this tumor and with the uterus, varying in size from a small egg to a large fist. The diagnosis of incarcerated fibroids could now be made, and their extirpation was proceeded with. In order to obtain more room, the incision was enlarged both upward and downward, and the other abdominal contents were kept away by large packings. Primarily the large mass of adherent omentum was ligated with interrupted catgut ligatures. The part to be removed was caught by clamps and divided. It was now possible to relieve the incarceration of the fibroid and to ligate the various ad-

hesions with silk. Considerable hemorrhage took place in the depth of the wound, though no distinct bleeding vessel was visible. All the raw surfaces bled profusely, but after a time the hemorrhage was controlled by numerous clamps and packings. The largest tumor was isolated and removed; two additional tumors were enucleated by incising the capsule and shelling out the mass. Hemorrhage controlled by clamp and ligature.

At this stage of the operation the condition of the patient was such that an early completion was strongly indicated. Therefore two clamps were left in place. Wound closed with through-and-through sutures.

Patient reacted very poorly after the operation, the pulse continuing rapid, requiring stimulation. On the following day patient fell into a condition of apathy alternating with stupor and delirium. After forty-eight hours the clamps were safely removed, but patient began to vomit; the pulse failed; and in spite of full stimulation, patient died on the same day.

Autopsy showed no trace of peritonitis.

DISEASES OF THE PERITONEUM AND ABDOMINAL WALLS. TOTAL, 4; DEATHS, 2.

	Total.	Cured.	Improved.	Unimproved.	Died.
General purulent peritonitis (cause not discovered)	1	..	..	..	1
Chronic peritonitis with adhesions	1	..	1	..	..
Tuberculous peritonitis (mixed infection)	1	..	..	..	1
Retroperitoneal tumor	1	..	..	1	..

Operations on the Peritoneum. Total, 2; Deaths, 2.

	Total.	Deaths.
Laparotomy and drainage for diffuse purulent peritonitis	1	1
" " " " tuberculous peritonitis (mixed infection)	1	1

Two of the four cases enumerated above ended lethally and their histories are detailed below. The case of peritoneal adhesions was not operated upon, experience having shown that in the course of time many of these cases recover or improve, even without any interference. It is to be regretted that in the case of the retroperitoneal tumor operation was declined by the patient, as, without operation or autopsy, an absolute diagnosis was impossible. On account of its interest a brief outline of the history of this case is also given.

1901, vol. ii., page 83. *General Purulent Peritonitis (cause not discovered); Chronic Catarrhal Appendicitis; Operation; Death.*—Nathan B., 45 years of age, was admitted to the hospital on March 10 with following history: Previous history is negative with the exception of a urethral stricture which was successfully operated upon nine years ago. Present illness began four days ago with vomiting, chilliness, and fever, and with persistent general abdominal pain. Bowels have continued to move with the aid of cathartics. No history of traumatism.

Physical examination on admission: Abdomen distended and tympanitic, with signs of free fluid. In the right iliac fossa an indefinite resistance was made out, which was tender on palpation. Temperature 102.2°, pulse 128, respiration 36.

In view of the grave condition of the patient an operation was decided upon.

Operation. Incision on the outer border of the right rectus. On opening the peritoneum thick, purulent fluid welled up into the wound. As the incision was enlarged for the purpose of better exploration, more and more pus came into the wound, issuing apparently from all directions of the abdomen. There were no limiting adhesions. The appendix was liberated and, after deligation, removed. The cutaneous incision was enlarged to seven inches. Much pus was found in the subphrenic, retrohepatic, splenic, and pelvic regions, but no primary source of infection could be discovered. After the introduction of efficient drainage, partial closure of the external incision.

Patient rallied somewhat after the operation, but later on pulse became weaker and extremely rapid. Death followed a few hours after the operation.

Autopsy was not permitted.

1901, vol. ii., page 96. *Tuberculous Peritonitis with Secondary Infection; Operation (Laparotomy); Death.*—Chaje B., 23 years of age, was admitted to the internal division of the hospital on January 10 with the following history: Family and past history negative. Present history of three or four months' duration. Its onset was insidious, and began with pain in the lower part of the abdomen, somewhat more marked on the left side. Very soon the abdomen began to swell, this continuing until the present time. There was fever during the past few weeks. No œdema of the lower extremities; bowels constipated; appetite poor.

On admission, following status was found: General condition poor; considerable emaciation; slight icterus of sclera; marked retraction of both supraclavicular spaces; some dulness with exaggerated breathing over both apices. The abdomen was much distended; dulness in both flanks; fluid wave present; fluid is movable with change of posture. In other respects examination is negative.

On January 15 paracentesis of the abdomen withdrew 151 ounces

of clear fluid; palpation after this procedure was, however, still negative. The fluid soon reaccumulated, and caused so much distress and dyspnea that paracentesis was repeated on January 30, 70 ounces of turbid serum being withdrawn. The physical signs of the thorax also changed, and, fluid being suspected, 32 ounces of a turbid serum were withdrawn from the left pleural cavity. No tubercle bacilli were found either in the feces or sputum. The temperature ran a very irregular course, high excursions alternating with low remissions.

Some of the ascitic fluid was injected into a guinea-pig, but it did not aid materially in strengthening the diagnosis of tuberculous peritonitis, as the animal died of a streptococcus infection.

Patient was transferred to the surgical service and operated upon on February 15. Median incision, about two inches long, above the umbilicus. On opening the peritoneum and separating some adhesions, a mass presented in the wound which was recognized as rolled-up omentum. It was adherent to all other structures in its vicinity; it showed numerous small tubercles and two or three large ones, which broke open on handling and permitted the escape of a few drops of pus. Suture of the lower part of the incision; drainage of that portion which came in contact with the pus.

Patient reacted well after the operation; but in its subsequent course the wound was very sluggish, there being apparently insufficient recuperative power. A continual discharge of pus weakened the patient so rapidly that she died on February 27.

A limited autopsy showed numberless miliary tubercles throughout the entire abdomen; all viscera matted everywhere together; spleen septic; healed cavity in right lung.

Epicrisis.—This history offers several points of importance, viz.

1. Paracentesis, done January 15, while patient was on the medical side of the hospital, removed clear serum.

2. Paracentesis, done as above on January 30, removed turbid serum.

3. The guinea-pig which was injected with the latter fluid died of a streptococcus infection.

The question naturally arises, why this difference in the two fluids aspirated at an interval of two weeks? While it is possible to explain the facts by assuming the presence of an autoinfection, the thought cannot be definitely excluded that the fluid may have been infected at the time of the first paracentesis.

1901, vol. ii., age 97. *Retroperitoneal Tumor, exact diagnosis impossible; Patient discharged unimproved.*—Israel S., 42 years of age, was admitted to the hospital on April 28 with the following history: Family and past history is negative. The present history is of about six months' duration, when patient began to have indefinite pains, with severe exacerbations, in the lower part of the abdomen. Four months ago patient was confined to bed for two months; is said to

have been jaundiced and to have had clay-colored stools. No chills, no fever, and no loss of weight.

On examination following status was found: A transverse mass was felt in the umbilical region of the abdomen; it was kidney-shaped, concave above, convex below, and extended about two inches to the left and three and a half inches to the right of the median line. Its vertical diameter was about two inches in the median line; at the middle of the right rectus (which represents the greatest bulk of the mass) about three inches. The portion to the right of the median line is persistently tender to pressure; it lies apparently in contact with the vertebral column and moves slightly with respira-

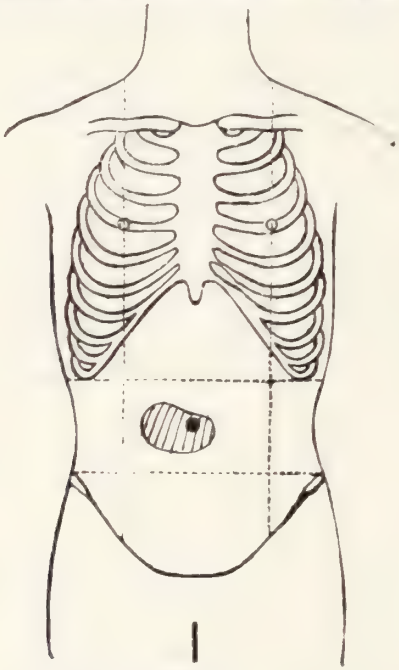


FIG. 4.

tion. Intervening between it and the anterior abdominal wall are coils of intestine giving a tympanitic resonance. (See Fig. 4.)

With the patient lying prone on the left side, the area of pulmonary resonance gradually goes over into the tympany of the intestines. On the right side the liver dulness extends well down to the rim of the ilium; bimanually a body occupying the normal position of the kidney can be ballotted.

Probable Diagnosis.—A transversely situated, retroperitoneal tumor; absolute diagnosis impossible.

Patient refused operative interference, and was discharged unimproved on May 1.

HERNIA. TOTAL, 24; DIED, 1.

	Total.	Cured.	Died.
Hernia, inguinal, reducible, single	10	9	1
" " " double	3	3	..
" " " congenital	2	2	..
" " " infantile	1	1	..
" " " sliding, of colon	1	1	..
" " " gumma of testicle; epilepsy	1	1	..
" " irreducible, very large[1]	1	1	..
" " congenital; undescended testicle	1	1	..
" femoral, reducible	3	3	..
" umbilical	1	1	..

STRANGULATED HERNIA. TOTAL, 14; DIED, 3.

Hernia, inguinal, strangulated[1]	2	2	..
" " " ascites; cholecystitis; obstructive jaundice[1]	1	1	..
" " " gangrene of small intestine; perforation; peritonitis[2]	1	..	1
" " congenital, strangulated	1	1	..
" " strangulation of omentum; secondary thrombosis of gastric mucosa	1	1	..
" femoral strangulated; gangrenous appendix in sac.	1	1	..
" " " small intestine and bladder in sac	1	1	..
" " strangulated[1]	2	2	..
" " " gangrene of small intestine.	2	..	2
" " " ovary and tube and extra-uterine pregnancy in sac..	1	1	..
" umbilical strangulated; spontaneous reduction[2]	1	1	..

Operations for Inguinal, Femoral, and Umbilical Hernia—39 Operations; 3 Deaths.

Bassini's operation for inguinal hernia[3, 4]	20	19	1
Halsted's " " " " (recurrent)	1	1	..
Bassini's " " " " ablation of testis..	1	1	..
" " " " " orchidopexy	1	1	..
" " " femoral hernia	3	3	..
Radical cure of umbilical hernia	1	1	..
Relief of strangulated inguinal hernia, combined with Bassini	4	4	..
Relief of congenital strangulated inguinal hernia, combined with Bassini	1	1	..
Relief of strangulated femoral hernia, combined with Bassini	3	3	..

[1]No gangrene of intestine.

[2]Not operated.

[3]In one patient with very large inguinal hernia a post-operative intestinal paralysis had to be relieved by an enterostomy. A third operation for the closure of this enterostomy had to be subsequently performed.

[4]In two cases of congenital herniæ the peritoneum forming the sac was dealt with by a modification of Longuet's method.

	Total	Cured	Died
Relief of strangulated femoral hernia, combined with appendicectomy and partial suture	1	1	.
Relief of strangulated femoral hernia; resection of gangrenous intestine	2	..	2
Relief of strangulated femoral hernia; ectopic gestation[1]	1	1	..

For the radical cure of inguinal and femoral hernia the Bassini method has, as heretofore, been employed. Chromicized catgut No. 2 is used for the deep sutures. Our cases, with three exceptions, all healed primarily. In one of these one of the deep sutures suppurated; in another a superficial skin necrosis interfered with faultless union; and in the third, a case operated upon by the house surgeon, an intense operative infection of the wound with streptococci resulted in the death of the patient. His history was as follows:

1901, vol. i., page 126. *Incarcerated Inguinal Hernia; Secondary Phlegmon of the Abdominal Wall; Streptococcemia; Death.* E. S., 62 years old, had inguinal hernia for seven years; the hernia from time to time became incarcerated. On admission, January 7, 1901, the hernia was reducible. On January 18 a typical Bassini operation was performed. The temperature, normal before the operation, commenced to rise at once after it, marking 104.6° the next evening; the pulse rate being proportionately increased, 120.

January 19: Dulness and crepitant rales at the right base. The temperature persisted between 103° and 104° for the next three days. On January 23 the wound was examined. The scrotum was found much swollen; both angles of the wound had opened, and a discharge of watery fluid was coming from each opening. The wound was opened in its entire extent and freely drained. The edema and swelling rapidly spread from the wound upward and outward on the abdominal wall. Multiple incisions were made on the following day into the edematous tissues, evacuating considerable pus. Spreads from this pus showed streptococci in almost pure culture. A blood culture was taken and the pathologist reported streptococci therein. In spite of energetic stimulation and free drainage of the local phlegmon, death occurred on January 27.

In three very obese subjects a superficial drain was inserted for several days.

Silver wire was employed in one case of recurrent inguinal hernia.

In two cases of congenital inguinal hernia, the peritoneum forming the sac was dealt with by a modification of the method suggested

[1]A posterior vaginal section for purulent exudate in Douglas' had to be made in this patient.

by Longuet and Winkelman for the radical cure of hydrocele. Our usual practice in these cases is to divide the peritoneum forming the sac, just above the testicle, leaving enough of it attached to the testicle to form for it a tunica vaginalis. The remaining part of the sac is then dissected away from the cord up to the level of the internal ring, where it is closed by a purse-string suture and ablated distally to this suture. This dissection is tedious on account of the brittleness and friability of the peritoneum, especially marked in young subjects. To avoid this step of the operation the peritoneum forming the sac is divided across at the level of the internal ring and at once closed by a purse-string suture. The sac is then split down to its lowest limit; the testicle and cord are next lifted out of their bed, the peritoneum everted, and its edges carried behind the cord and testicle. It is retained in this position by a few catgut sutures. The peritoneum, thus turned inside out, renders the formation of a hydrocele very improbable. Time and labor and secondary hematoma are saved, and the result in our cases has been entirely satisfactory. This modification of the operation for congenital hernia will be reported at a subsequent time by Dr. Berg.

Attention has recently been called to the occurrence of gastric symptoms following upon ligation and ablation of the omentum, in whole or in part. In the past year several instances of persistent vomiting and intense gastric pain, where sections of the omentum have been deligated and removed, have occurred. In accordance with views of the recent experimenters in this field, we are inclined to attribute these symptoms to the thromboses of the gastric veins following upon the deligation of the omentum. The history of one case is as follows:

1901, vol. i., page 120. *Strangulated Omental Inguinal Hernia; Bassini's Operation; Post-operative Persistent Vomiting and Gastric Pain; Cured.*—E. W., a peddler, 29 years old, admitted with a strangulated hernia on September 25, 1901. He was a healthy man. The strangulation was of three days' standing. Urine normal. Immediate operation upon admission. The hernial sac contained a mass of dusky-colored omentum, which was deligated and ablated. Typical Bassini operation for radical cure performed. Primary union obtained.

On October 5, ten days after operation, the patient vomited four times, the vomitus consisting of greenish, watery fluid. No cause could be found for the vomiting. On October 6 the vomiting continued, so that all nourishment by mouth had to be stopped. Temperature 99°-100°.

October 7: Patient complained of inclination to vomit; this con-

tinued for several days. An indefinite sense of resistance was to be appreciated over an area about two inches in diameter immediately to the right and just below the umbilicus. Pain on pressure over the stomach.

October 13: Patient feels better; pain disappeared, and he is able to take soft nourishment.

The contents of the sac in three of our cases of strangulated femoral hernia were unusual. In one there was a gangrenous appendix; in another the bladder wall had been drawn down alongside of but external to the sac; in a third, there was a large blood clot, an ovary and a tube, the latter being the seat of a pregnancy. Whether the gangrene of the appendix was due to the strangulation in the hernial sac was not ascertained at the operation.

The two patients with gangrenous intestine in strangulated femoral hernia died. In one the strangulation had existed six days. About two inches of small intestine was gangrenous and ruptured during very gentle manipulations. Resection and end-to-end anastomosis by suture. Marked weakness manifested itself immediately after operation. Temperatures were but slightly elevated, the bowels moved, and considerable nourishment was taken. Gradual failure of strength and pulse; and death on the ninth day. Postmortem revealed a marked intestinal distension; no peritonitis.

In the other patient the strangulation existed three days. About three inches of the intestine was necrotic. Resection and end-to-end anastomosis by Murphy's button. Marked distension of the proximal coils of intestine. Death on the fourth day from intestinal paralysis. Postmortem showed no peritonitis.

VENTRAL HERNIA. TOTAL, 10; DIED, 1.

	Total.	Cured.	Improved.	Unimproved.	Died.
Median ventral hernia	5	4	..	1	..
At outer border of rectus, following appendicitis operation	1	1	..	..	..
At outer border of rectus, with chronic appendicitis	1	1	..	..	..
Infrapubic and inguinal herniæ; strangulation, spontaneous reduction	1	..	1	..	..
Ventral, epigastric hernia	1	1	..	..	..
Strangulated ventral hernia; gangrene of small intestine; perforation of colon	1	..	..	..	1

Operations for Ventral Hernia—9; 1 Death.

	Total.	Cured.	Improved.	Unimproved.	Died.
Mobilization and suture of anterior and posterior layers of recti sheaths	1	1	..	..	..
Layer suture, in median line, of recti sheaths	4	4	..	..	..
" " of rectus sheath at its outer border.	1	1	..	..	..
" " " " " " " appendicectomy	1	1	..	..	..
Layer suture of rectus sheath at its outer border; right oöphorectomy	1	1	..	..	..
Relief of strangulated ventral hernia; resection of small intestine, and suture of perforated colon	1	..	..	..	1

Primary union was obtained in seven cases. In one suppuration and sloughing of part of the recti sheaths took place, but this did not impair the success of the operation. Silver wire was used in one of the cases. Otherwise chromicized catgut was employed.

1901, vol. i., page 139. *Strangulated Ventral Hernia; Gangrene of Small Intestine; Resection; End-to-end Anastomosis by Button; Closure of a Rent in the Colon; Death.*—M. K., admitted July 25. Had a ventral hernia following operation for appendicitis twelve years ago. Strangulation existed for twenty-four hours. At time of operation a loop of small intestine was found to be gangrenous. Resection and end-to-end anastomosis by Murphy's button. A rent in the colon was also discovered through which fecal extravasation had occurred. Closure by suture. Partial closure of abdominal wound. Death from peritonitis on the third day.

DISEASES OF RECTUM AND ANUS. TOTAL, 48; DIED, 1.

	Total.	Cured.	Improved.	Died.
Hemorrhoids, internal and external	20	20	..	..
" " strangulated	3	3	..	..
" " chronic cystitis	1	1	..	..
" " endometritis	1	1	..	..
Ischiorectal abscess	6	6	..	..
" " and hemorrhoids	2	2	..	..
" " " fistula in ano	1	1	..	..
Fistula in ano	9	9	..	..
Benign stricture of rectum	3	3	..	..
Carcinoma of rectum; obstruction of bowels	1	..	..	1
" " " laryngeal tuberculosis	1	..	1	..

Operations on Rectum and Anus—50; 1 Death.

	Total	Cured	Improved	Unimproved	Died
Clamp and cautery operation for hemorrhoids	25	25	..	..	..
Ligature operation for hemorrhoids	1	1	..	..	..
Combined ligature and clamp and cautery operations	1	1	..	..	..
Injection of carbolic acid into hemorrhoids	1	1	..	..	..
Incision of ischiorectal abscess	8	8	..	..	..
Division of fistula in ano	9	9	..	..	..
Linear proctotomy for benign stricture	2	2	..	..	..
Colostomy for malignant stricture and intestinal obstruction	1	..	..	..	1
Resection of rectum (Rehn) for carcinoma	1	..	..	1	..
" " " (Diffenbach) for benign strictures	1	1	..	..	..

KIDNEY AND URETER. 12 CASES. 15 OPERATIONS ON 9 PATIENTS.

		Total	Cured	Improved	Unimproved	Died.
1 and 2	Renal calculus[1]	2	..	1	1	..
3	" " pyonephrosis	1	1	..	..	..
4	Suppuration of renal infarct	1	1	..	..	..
5 and 6	Tubercular pyonephrosis	2	2	..	..	..
7	" " and tubercular ureteritis	1	1	..	..	..
8	Pyonephrosis	1	..	..	..	1
9	Suppurating hydronephrosis, left; pyonephrosis, right side; pregnancy; anuria	1	1	..	..	..
10	Actinomycosis of kidney; perinephritic abscess	1	..	..	..	1
11	Sarcoma of aberrant suprarenal body	1	1	..	..	..
12	Nephroptosis[1]	1	..	..	1	..

List of Operations.

	Total.	Died.
Nephrotomy	6	..
Nephrectomy	7	1
Ureterectomy	1	..
Incision of perinephritic abscess	1	1

1901, vol. iii., page 184. *Renal Calculus; Stone Passed; Discharged Improved; No Operation.*—Nathan L., 55 years old, pensioned policeman; robust, well-preserved man. Five years ago severe painless hematuria, which ceased spontaneously. For a year past suffered with repeated attacks of severe renal colic accompanied by radiating penile pain and vesical tenesmus. During one of these attacks he was unable to pass any urine. Observed gravel in his

[1]No operation.

urine from time to time. Present illness commenced September 25, 1901. Admitted October 14, 1901. Physical examination revealed nothing abnormal except a distinct pressure pain when the region of the right kidney was bimanually handled. Temperature normal. Urine microscopically: Uric acid and oxalate crystals, red blood cells; traces of albumin; otherwise normal.

October 18: Preparatory to nephrotomy, he was placed in a hot bath; while in it he was seized with a severe attack of renal colic lasting several minutes; immediately he felt a desire to urinate, and, the stream of urine being suddenly interrupted, he passed a calculus about the size of a large pea. The operation was thereupon deferred and he was discharged.

1901, vol. iii., page 185. *Renal Calculus; No Operation.*—Joseph T., 21 years old, peddler. For the past three years suffered from a number of attacks of renal colic. Whenever the attacks subsided his urine became bloody. Pain located in the left loin, radiating to the penis and left thigh. The attacks returned about every four weeks.

On admission, June 28, 1901, he was in a fairly well nourished condition. Physical examination revealed nothing abnormal beyond pressure pain in the left loin. Kidneys non-palpable.

July 1: Cystoscopy. Bladder normal; massage of left kidney pelvis and ureter was followed by discharge of small quantity of turbid material from left ureteral orifice. Urine normal, except for presence of few pus cells and few calcium oxalate crystals.

July 7: Patient declined operation and was discharged unimproved.

1901, vol. i., page 34. *Renal Calculus; Pyonephrosis; Nephrotomy; Nephrectomy; Cured.*—Sarah L., 28 years old. Admitted October 17, 1900. Multipara. Three years ago had an attack of renal colic with radiating pain in the genitals and thigh; tenesmus; the attack terminated with the passage of two small stones. From that time on she noticed a constant pain in the right loin. Never saw any blood in her urine, which was, however, constantly turbid. Four weeks ago she had an unusually sharp attack accompanied by nausea; the attack subsided after a week. She had lost much flesh and strength. Her appetite declined.

Examination on admission revealed a normal condition of the internal organs; pulse and temperature normal. In the right loin a large, tender tumor could be palpated; its outlines could be readily seen, extending to the median line, and downward to the level of the umbilicus. It was smooth, moderately movable, and could be well depressed into the loin.

October 8: Cystoscopy revealed a moderately congested bladder, and pus escaping from right ureter. The urine was cloudy, acid, the sediment consisting of pus, epithelial cells, and mucus; daily amount, 15 ounces; no casts; no tubercle bacilli.

October 22: Temperature rose to 101°. Passed only 18 ounces of urine. Patient's general condition was so poor that she was put upon a strengthening regimen.

November 16: Nephrotomy. Oblique lumbar incision. After dividing a scanty layer of fat, the kidney was exposed and delivered. It was fluctuating. Puncture yielded pus. Incision along convex border evacuated large quantities of foul pus. On palpation a large stone could be felt, which crumbled away in the grip of the forceps. By means of irrigation considerable débris was removed from the pelvis of the kidney. Hemorrhage was considerable, and, the patient's condition having become alarming, the kidney was drained and replaced. The patient readily rallied from the operation, the quantity of urine increased, but temperature elevations were observed every evening. Though the external wound had healed except for the drainage opening, pus continued in the urine. On December 21 it was decided to make a nephrectomy, because her general condition continued precarious, demanding radical relief. Besides, a distinct tumor remained behind, showing that the kidney was still unsound. Previous to operation preliminary intravenous infusion of 1,000 c.cm. of saline solution.

Chloroform anesthesia. Incision in old scar. The kidney was found closely adherent to peritoneum, which latter was accidentally opened, but immediately closed by suture. A second peritoneal tear occurred in delivering the upper pole of the kidney, which could not be closed by suture, and had to be protected by packing until the organ was removed, when it was also closed. The fibrous capsule of the kidney was found so intimately adherent to the surrounding tissues that the ordinary plan of enucleation had to be abandoned. The fibrous capsule was therefore split along the entire convexity of the kidney. Thus the parenchymatous portion could be readily enucleated. After securing the massive pedicle in an elastic ligature, the kidney was cut away. The wound was packed with iodoform gauze, which was brought out at the upper angle; the lower angle was closed by a few button sutures. *Specimen of kidney:* Somewhat shrunken, 4 by 2 by 1 inch; the cortex and pyramids atrophic, yellow, here and there containing islands of normally colored parenchyma.

Patient bore operation fairly well; needing, however, continuous exhibition of stimulating enema, mainly on account of her nausea and occasional vomiting.

December 22: Quantity of urine, 16 ounces; no albumin; traces of pus; urea, 2.4 per cent.

December 23: Bowels moved with calomel and salts; urine, 11 ounces.

December 26: Temperature normal.

December 28: Urine, 23 ounces; no pus or albumin. Change of deep dressings. Considerable discharge. Her general condition gradually improved. She continued to void scanty urine.

January 13, 1901, ligature came away. February 17, discharged cured, in very good condition.

1901, vol. i., page 33. *Suppuration of Renal Infarct; Nephrectomy: Cured.*—Mabel F., 24 years old; married; nullipara. No history of previous renal trouble. Ten days ago paroxysmal pains appeared in right loin, radiating to bladder. Vomited all ingesta. Was in bed for four days. Day before admission had severe chill and fever.

On admission, November 5, 1900, examination revealed a good general condition. Lungs and heart normal. The abdominal parietes of right side rigid. Pressure in right hypochondrium and lumbar region very painful; a resistance could be felt there, the lower border of which extended to umbilicus, and which could not be well differentiated on account of the abdominal rigidity. The diagnosis was difficult; however, appendicitis and cholecystitis were excluded; and the presence of the lumbar pain determined us to look for the trouble in the right kidney.

November 7: Nephrectomy; chloroform. During induction of anesthesia severe epistaxis set in, necessitating tampon of anterior and posterior nares. Oblique right lumbar incision. Puncture of exposed kidney yielded only blood. Near the anterior angle of the wound the peritoneum was sufficiently incised to permit exploration, demonstrating that the abdominal organs were normal; after closure of this incision the kidney was delivered. It was of normal size, and distinctly lobulated. Occupying the middle lobe, in wedge shape, was seen a discolored pyramidal area of reddish-brown tissue. This being laid open by an incision along the convexity, it was found to be interspersed with streaks of yellowish pus. The wedge penetrated the entire thickness of the pyramidal and cortical tissue. The vessels of the kidney were isolated and separately secured with silk; the ureter was then drawn out and divided at a distance of about four and a half inches from its renal end, and its distal end ligated; gauze drainage of stump; wound closed with button suture.

Uneventful recovery followed; patient discharged cured December 5, 1900.

Remark.—When the peculiar condition of the kidney had been ascertained, the question arose whether the organ could not be saved by excising the affected portion of the kidney and uniting the two polar portions by a suitable suture. It was found, however, that in carrying the incision through healthy tissues, injury to the renal vessels and pelvis could not have been avoided; hence nephrectomy was decided upon.

1901, vol. i., page 35. *Tubercular Pyonephrosis; Nephrectomy; Cured.*—Mary H., 24 years old; music teacher; single. She was told that when 9 years old she suffered from "spinal trouble," for which she wore a jury mast during six months. Preceding this trouble she had a discharging ear. Since then she has been well. No cough, no night sweats. Three years ago, commenced to complain

of frequent urination, which was painful at the end. At present she has to empty her bladder every two hours. Eighteen months ago blood appeared in her urine; sometimes it was fresh, at other times clotted. A physician, having cystoscoped, told her that she had an ulcer of the bladder. A week ago, noticed a dull pain in right lumbar region, radiating to shoulder blade. Shortly after she had an extremely severe attack of renal colic.

On admission, December 6, she was in fair condition; examination of heart, lungs, liver, and spleen revealing normal conditions. In the right hypochondrium a large mass could be felt, which bimanually showed itself to occupy mainly the loin. It was slightly movable, tender to touch; no respiratory movement. The colon could be percussed in front of it, while the percussion of the loin was flat. Temperature and pulse normal. Urine acid, 1024, containing 1 per cent. of albumin (Esbach), with a sediment of half an inch of pure pus in the test tube; urea 2.2 per cent. Amount of urine, 45 ounces. Urinated every hour.

December 8: Cystoscopy. Bladder trabeculated; mucosa normal, except in trigonum, where it was intensely congested. During inspection a jet of clear urine was emitted by left ureter. In spite of deep anesthesia the bladder was intolerant, holding 3 ounces with difficulty.

December 10: Nephrotomy; ether. On account of the poor pulse, an intravenous saline infusion of 1,000 gm. was made. The enlarged kidney being exposed, aspiration withdrew pus. The reflection of the peritoneum being exposed, it was incised, and the hand was passed into the abdomen to ascertain the presence of the left kidney, which was found to be normal in size and consistence. Peritoneum closed. The exposed kidney showed two fluctuating areas, in which the wave was not transmitted from one to the other. These foci were incised and evacuated of their grumous contents. The patient's condition beginning to fail, the kidney was replaced and the outer wound packed, nephrectomy being postponed to another occasion. The operation was followed by a severe chill, which might, however, have been due to the saline infusion. Otherwise the operation was followed by hardly any fever, and the irritability of the bladder was markedly diminished.

The discharge from the kidney continuing profuse, nephrectomy was performed December 31. Development of the kidney was easily accomplished, and, the pedicle being secured by a rubber ligature, the organ was removed. During the manipulations another abscess, located in the upper pole of the kidney, was opened. Gauze drainage and closure of anterior angle of the wound by button sutures. Operation was well borne, little reaction following.

January 3, 1901: All packings renewed. Urine clear, acid, and of sufficient quantity.

January 13: Delay in the casting-off of the pedicle and ligature induced us to apply elastic traction.

January 18: Patient out of bed.

January 26: Ligature came away. Irritability of bladder very much improved.

February 8: Discharged cured.

1901, vol. iii., page 189. *Tubercular Pyonephrosis; Nephrotomy; Nephrectomy; Cured.*—Jacob E., tailor. Eight months ago had "attack of gravel," with pain in groin and penis; turbid urine; no hematuria. For past four months suffered from abdominal pain of constant character but varying severity; attacks more severe at night. Had lost 30 pounds in these four months.

On admission, April 18, his condition was poor and anemic; temperature 102.6°. Retraction above and below both clavicles. Crepitant râles in both lungs. Heart, liver, and spleen normal. Right rectus rigid. One and one-half inches below xiphoid process a small, reducible ventral hernia. Bimanual palpation of right hypochondrium and loin is painful, but, on account of muscular rigidity, is unsatisfactory. Rectal palpation shows hard, painless nodule occupying median portion of prostate. Urine cloudy, acid, 1022; traces of albumin; copious sediment containing only pus cells; daily amount, 30 + ounces.

April 22: Examination under chloroform. A large, nodular mass found occupying right flank, colon being displaced forward. Aspirating puncture in lumbar region yielded pus. Cystoscopy. Right ureteral orifice dusky and congested; left ureteral orifice normal.

April 26: Nephrotomy and drainage; ether. Oblique lumbar incision. Kidney being exposed, it was opened along the convexity, a system of abscess cavities being evacuated. The intervening septa were broken down; one of the divided septa bled very profusely; as the brittle parenchyma would not hold a ligature, a clamp was left *in situ;* three large drainage tubes introduced; the wound partly closed and dressed in ordinary fashion. Considerable febrile reaction followed, temperature rising to 104° F.

April 27: Profuse discharge of bloody serum.

April 29: Clamp removed, packings changed. Gradually the discharge became purulent, and continued to be very profuse.

May 27: Nephrectomy. Incision in old scar. Granulating sinus excised down to kidney. Difficult isolation and development of shrunken kidney, during which a number of small abscesses were ruptured. While applying the elastic ligature to the pedicle, the latter was torn through in the kidney substance. By a lucky pass the retracted pedicle of the kidney was secured, clamped, withdrawn, and tied with a double silk ligature passed with a Deschamps needle. After this it was found that a portion of kidney tissue belonging to the upper pole had been left adherent to the surrounding capsule. This was isolated, its pedicle secured and cut away. Irrigation; drainage and partial closure of wound as usual.

May 28: Moderate febrile reaction followed, and the discharge from the wound gradually diminished. Ligatures cast off July 11.

July 28: Discharged cured. Urine became gradually clear and practically normal.

1901, vol. i., page 36, and vol. iii., page 188. *Tubercular Pyonephrosis: Nephrectomy; Secondary Ureterectomy; Cure.*—Hyman G., tailor, 39 years old. Last July, was suddenly taken with severe chill, fever, vomiting, and suppression of urine, accompanied by pain in right side. Was jaundiced for two months. Feet have a tendency to swell. During the past three months noticed increasing weakness and puffiness of feet. Had lost 25 pounds weight. Noticed continuous pain in right side; urination painless.

On admission, December 3, 1900, lungs: retraction above both clavicles; dulness both apices; râles. Heart normal. Liver slightly enlarged. Spleen normal. Slight kyphosis corresponding to eleventh dorsal vertebræ. Right side of abdomen visibly bulging. Corresponding to this is felt, in the right hypochondrium, a large globular mass reaching the median line, and which can be bimanually manipulated between the loin and anterior parietes. The colon can be felt and percussed passing over its lower pole. The tumor shows indistinct fluctuation.

December 10: Cystoscopy. Trabecular bladder; mucosa normal; left ureteral orifice normal; right ureteral orifice normal except for a surrounding capillary injection. Aspiration of tumor through loin yielded abundant sero-pus. Pulse 60-72, temperatures normal or slightly elevated. Examination of aspirated fluid showed it to contain trace of albumin, pus, red blood cells, and abundant tubercle bacilli. Urine, trace of albumin, no casts.

December 11: Patient's condition evidently deteriorating, it was decided to proceed to radical measures.

December 14: Nephrectomy. After free stimulation, oblique lumbar incision, exposure of peritoneal reflection, and development of the large, fluctuating tumor. This development was much facilitated by evacuating several discrete abscess cavities. The tumor was found to be a large pus sac, the renal elements having all disappeared. The renal vessels, having been separated, were individually tied with catgut and divided. The thickened ureter was exposed for the distance of about 7 inches, divided, and distal stump tied with catgut. As the wound had been soiled by pus, a Mikulicz tampon was applied and the anterior angle was closed with button sutures. The pulse having become rather weak, an intravenous saline infusion of 1,000 gm. concluded the operation; there followed a pronounced chill, probably due to the infusion. Slight febrile reaction followed. The patient passed during the first three days between 15 and 20 ounces of urine daily.

December 19: Cavity repacked.

December 21: Patient coughing. Tubercle bacilli found in sputa.

January 5, 1901: Patient out of bed. Wound contracting.

February 12, 1901: Discharged with moderately secreting sinus.

Readmitted April 10, 1901. Sinus still persists. Patient complains of pain over the right inguinal region. Patient had gained some flesh since discharge, but is complaining of frequent and painful urination. Urine normal, containing no tubercle bacilli. Sinus 6 inches deep.

April 16: Sinus was thoroughly curetted and drained. In spite of all stimulation of the granulations, there was no tendency to a closure.

April 30: Injected iodoform-glycerin, which was repeated a number of times. Patient frequently complains of chilliness, temperatures at such times being subnormal.

June 3: Ureterectomy. After passing probe into the sinus to a depth of 10 inches, the integument and soft parts were divided along its track. The peritoneal reflection being found and detached, it was reflected inward. The stump of the ureter was thus exposed at its crossing with the common iliac artery. It was liberated near its vesical end, there divided between two ligatures one-half inch from its vesical insertion, and detached from its bed from below upward, the only difficulty being encountered near the crossing place, where the adhesions were very close. The sinus being curetted, a packing of iodoform gauze was introduced and the wound closed in the usual manner. A short and moderate rise of temperature followed. Uninterrupted recovery.

July 21: Discharged cured.

1901, vol. iii., page 187. *Pyonephrosis; Nephrectomy; Died.*—Anne S., 38 years old. Ten weeks ago, began to complain of severe pain in the left side, accompanied by flow of bloody vaginal discharge. Curettage was performed at Kings County Hospital, Brooklyn, from which she was discharged after six weeks. Had lost much flesh.

On admission, September 2, 1901, the following facts were noted. Patient emaciated; internal organs apparently normal. In the right lumbar region a mass the size of a child's head could be felt. It was movable, hard, non-fluctuating, tender, and kidney-shaped. Bimanually it could be ballotted between loin and anterior parietes. Rectal and vaginal examination yields negative results. Pulse and temperature normal. Urine pale, 1006; albumin; much pus and epithelia; no casts; urea 1 per cent.; daily quantity of urine, 20 ounces. Attempt was made to determine the kidney sufficiency of the left side, but no positive result of the examination followed. Cystoscopy. Turbid, purulent urine descending from both ureters.

September 6: Nephrectomy. Lumbar aspiration of the tumor yielded seropurulent fluid. Lumbar incision. Peritoneal reflection exposed, peritoneum opened, and other kidney felt and palpated. Difficult development of the kidney, which being delivered, the pedicle was secured by a rubber ligature and the organ ablated. Mikulicz tamponade; drainage and usual closure of wound. Duration of operation, forty minutes.

September 7: Patient very restless. Has not reacted well from the operation. Great thirst; tongue dry; pupils dilated. Temperature 103.6°, pulse 144. Quantity of urine, 21 ounces, heavily charged with pus, containing also hyaline and granular casts; urea 1 per cent. The condition declined continuously in spite of energetic stimulation.

September 10: Died.

Postmortem.—Left kidney markedly lobulated; capsule not adherent; marked degeneration; acutely congested; cortex swollen and contained numerous hemorrhages. Peritoneum normal.

Comment.—It was evident that in this patient we had to deal with a bilateral kidney affection, as purulent urine was seen descending from both ureters. The right kidney appeared to be the more seriously involved, and, as the patient was daily losing ground, something had to be done to radically relieve her. It was impossible from urea estimation and amount of urine to determine the separate kidney sufficiency. In the attempt to relieve the patient by removing the right suppurating organ, the left kidney proved itself insufficient, and death resulted.

1901, vol. iii., page 186. Clara S., married, 21 years old, one child. Was perfectly well until six months ago, when she began to suffer from what was declared to be malaria. She has missed her last three periods. Had morning nausea and vomiting, and frequent micturition, considering herself to be pregnant. Three days ago developed severe pain over left hypochondriac region; the following morning had chill with rise of temperature to 102°; a second chill the following night. During this the right lumbar pain was very acute. Felt continuously nauseated; vomiting frequently. Had passed no urine voluntarily for three days. Had been twice catheterized; both times one ounce of pure pus was withdrawn.

On admission, March 5, 1901, a very pale and anemic body was observed; facial expression anxious; patient exhaling a urinous odor. Uterus about the size of a large fist; position that of normal anteflexion. To the right of the uterus a painful mass of the size of a hen's egg can be felt. The left hypochondrium and lumbar regions occupied by a large, rounded mass, which was also painful on handling. Pain is elicited on bimanual pressure over the opposite loin, though it is not as acute as on the other side. Dry pleural friction sounds at bases of both chests. Bladder absolutely empty. A preliminary diagnosis of acute suppression of urine was made, its presumable cause being a pyonephrosis of the left side and a reflex anuria of the right kidney.

Immediate double nephrotomy. Operation commenced under local anesthesia and was continued and finished under chloroform. After infusing the skin and deeper tissues with eucaine and Schleich solu-

tion, the left loin was opened by a four-inch incision; the patient complained bitterly, and chloroform was given; the kidney being exposed, it was found enlarged, its pelvis dilated. An incision through its convexity permitted the escape of two pints of turbid urine. Rubber tube drainage, and packing. The patient being turned over, a similar incision exposed the right kidney, with the intention of splitting its capsule. It was found contracted, exhibiting a softened area, from which a quantity of pus was voided by incision. Thereupon the entire kidney was split, permitting the escape of pus from several cavities. Rubber tube drainage, packing, and large external dressing. Time of operation, one hour; chloroform anesthesia, thirty-five minutes. The patient bore operation very well.

March 6: No urine found in bladder. Escape of bloody mucus from vagina. Incomplete abortion. Nine A.M., curettage under chloroform. Intravenous infusion. Temperature almost normal, pulse about 100. Very copious urinous discharge from both wounds.

March 10: Packings renewed. No urine passed from bladder.

March 11: Temperature 103°. Urinous discharge still copious. The urinous discharge from the wounds continued to be very copious. On account of the continued fever, on March 18 right nephrectomy was done. The previous incision being sufficiently enlarged, the kidney was, on account of dense adhesions, developed with considerable difficulty; elastic ligature around pedicle; ablation of kidney; drainage and usual dressing. The removed organ consisted almost entirely of fatty and fibrous tissue. Of the parenchyma, only the rudiments of a few papillæ could be identified. Intravenous infusion following operation.

March 19: Passed for the first time 3 ounces of urine from bladder, then passed 5 ounces. Urine contained a thick sediment. The healing of both wounds progressed satisfactorily.

March 31: Passed small amount of urine voluntarily.

April 1: Passed urine voluntarily four times, each time 3 ounces; the rest of the urine passing through the wound.

April 7: Ligature cast off. Out of bed. Passed 39 ounces of urine which was fairly clear; reaction neutral; 1014; trace of albumin; no sugar; 1.6 urea; no casts; a few pus and epithelial cells.

April 14: Tube withdrawn from left kidney.

April 21: Wound healing rapidly. No urinary leakage from sinus. Passes between 30 and 40 ounces of urine daily.

Discharged cured May 8 in excellent condition.

1901, vol. iii., page 191. *Actinomycosis of Kidney with Secondary Perforation into Perinephritic Tissues and Descending Colon; Nephrotomy and Drainage of Perinephritic Tissues; Death.*—Helen S., 18 years old; lady's maid. Was ill seven weeks; during the first four she was in bed on account of fever, which was declared to be typhoid. Had been suffering with a dull pain in the back, especially marked on left side. During the remaining three weeks she felt better

and was out of bed. Three days ago she had a sharp attack of pain on left side with fever and chill. Noticed nothing abnormal about urination.

On admission, May 12, 1901, temperature was 102°, pulse 108. Her condition was fair, somewhat anemic. Internal organs apparently normal. In the left loin a rather superficial fluctuating tumor was observed, extending so far forward as to be visibly raising the anterior abdominal parietes. This mass was not influenced by respiration, and the transverse colon was occupying its lower border.

May 10: Large perinephritic abscess was opened, containing granules which proved to be actinomyces. By means of usual oblique incision, a very large quantity of extremely fetid fecal pus was evacuated. The cavity being widely opened and cleansed, the kidney was exposed and aspirated, pus of the same character being gained. The kidney was widely opened and a drainage tube was inserted. A communication with the descending colon was also noticed, and the entire wall of the abscess cavity was gangrenous. The subsequent course of the illness was characterized by extensive necrosis of the connective tissue and a continued sepsis. An extremely fetid, fecaloid, and seropurulent discharge gradually undermined the patient's strength, and she succumbed June 16. Actinomycosis granules were continuously discharged in the pus.

Postmortem not permitted.

1901, vol. iii., page 192. *Sarcoma of Aberrant Suprarenal Body; Nephrectomy; Cure.*—Yetta E., 56 years old. Present trouble began four months ago with sharp pains in right lumbar region, radiating downward to groin, accompanied by the voiding of bloody urine. She had to stay in bed for several days during this attack. Since then similar seizures have appeared at shortening intervals, the patient losing strength and flesh visibly.

Admitted June 2, 1901. General condition well nourished; somewhat anemic. Temperature and pulse normal. Skin slightly icteric. Internal organs normal, except the heart, which showed a soft-blowing murmur at apex, extending over pulmonic area. In the abdomen, and occupying the right loin, and extending forward to within one inch of the umbilicus, was a large, nodular mass. It could be easily manipulated bimanually, was fairly movable, and occupied evidently the retroperitoneal space. Per vaginam and rectum nothing abnormal. The urine between 25 and 35 ounces in daily amount; contained albumin, many red cells, no pus, no elements suggestive of neoplasm.

June 3: Multiple aspirations were made, but blood only was obtained. Temperatures normal, pulse normal. Diagnosis: Neoplasm of kidney.

June 7: Nephrectomy; gas and ether anesthesia. Oblique lumbar incision on right side. A large hematoma was found occupying the place of the exploratory aspirations. In liberating the kidney the peritoneum was accidentally opened and immediately closed. On

account of the necessity of giving the tumor a wide berth, the peritoneum was injured a second time. The pedicle being exposed, its vessels were separately deligated with silk. Then the whole mass was firmly withdrawn, and a rubber elastic mass ligature was placed as high up as possible and well away from the kidney, which was then cut away. Mikulicz packing and closure of anterior angle of wound with button sutures.

Uneventful recovery followed; urine was bloody until June 10, after that it became perfectly clear. Ligature came away June 28. Discharged cured July 28.

1901, vol. iii., page 183. *Nephroptosis; Declined Operation; Unimproved.*—Josephine G., farmer's wife, 48 years old. Had three children. Operated on four years ago for polypus uteri. Had suffered for past nineteen years from dragging pains in right side of abdomen, where she noticed a movable mass. This dragging pain is occasionally augmented to paroxysmal severity and is then accompanied by vomiting.

On admission, June 4, there was found a poorly nourished body, markedly anemic, internal organs all apparently normal. Abdomen: In right hypochondrium and iliac region a smooth, kidney-shaped, and movable mass is to be felt; this can be pushed back well into the loin, where it remains until the patient assumes the upright posture. Rectal and vaginal examination negative. Pulse and temperature normal. Evidently we had to deal with a condition of nephroptosis, accompanied by the usual neurasthenic symptoms. As we could not give an assuring prognosis as to complete recovery, the patient declined surgical treatment and on June 7 was discharged unimproved.

DISEASES OF THE MALE GENITAL AND URINARY ORGANS. TOTAL, 36; DIED, 3.

	Total.	Cured.	Improved.	Unimproved.	Died.
Gonorrheal cystitis and urethritis	1	..	1	..	..
Cystitis; retention of urine; enlarged prostate	1	..	1	..	..
Perivesical and perirectal abscess	1	..	1	..	..
Periureteral abscess; prevesical abscess; ischiorectal abscess; sepsis	1	..	..	..	1
Foreign body in bladder	1	1	..	..	..
Vesical calculus	1	1	..	..	..
" " and hemorrhoids	1	1	..	..	..
Hematuria (tumor of bladder?)	1	..	1	..	..
Papilloma of bladder (renal calculus?)	1	..	1	..	..
Torsion of undescended testicle; congenital inguinal hernia	1	1	..	..	..
Varicocele	4	3	..	1	.
" atrophy of testicle	1	1	..	..	..
Hydrocele	1	1	..	..	..
Epididymo-orchitis, traumatic	1	1	..	..	..

	Total	Cured	Improved	Unimproved	Died
Epididymo-orchitis, gonorrhoic	2	2	..	..	..
" " seminal vesiculitis, gonorrhoic	1	1	..	..	..
Tuberculosis of testicle	4	3	..	1	..
" " " seminal vesicles and prostate	1	1	..	..	..
Complete denudation of skin of penis	1	1	..	..	..
Periurethral abscess	1	1	..	..	..
" " prostatic abscess	1	1	..	..	..
Urethral calculus	1	1	..	..	..
Stricture urethræ (deep)	3	3	..	..	..
Hypertrophy of prostate gland; catheterism	1	1	..	..	..
" " " " retention of urine; sepsis	1	..	..	..	1
Prostatic abscess; gonorrhea	1	1	..	..	..
Epithelioma of glans penis; stricture urethræ; scrotal fistulæ; pyelitis, bilateral; cystitis	1	..	..	..	1

Operations on Male Urinary and Genital Organs—29; 3 Deaths.

Cystoscopies:					
Incision and drainage of perivesical and perirectal abscesses	1	..	1	..	..
Incision and drainage of prevesical, periureteral, and ischiorectal abscess	1	..	..	..	1
Incision and drainage of periurethral abscess	2	2	..	..	..
" " " " prostatic abscess	1	1	..	..	..
Suprapubic cystotomy for foreign body in bladder[1]	1	1	..	..	..
Suprapubic cystotomy for calculi[2]	2	2	..	..	..
" " " " cauterization of diffuse vesical papilloma	1	..	1	..	..
Suprapubic cystotomy for retention of urine; enlarged prostate	1	..	..	..	1
Suprapubic cystotomy for drainage	1[3]	..	..	..	..
Median perineal section for calculus lodged in posterior urethra	1	1	..	..	..
Ablation of twisted undescended testicle; Bassini's operation for hernia	1	1	..	..	..
Ablation of atrophic testicle	1	1	..	..	..
" " tubercular testicle	3	3	..	..	..
" " " " with removal of vas deferens, vesicle, and one-half of prostate	1	1	..	..	..
Resection of veins for varicocele	5	5	..	..	..
Plastic operation for restoring skin of penis	1	1	..	..	..
External urethrotomy for stricture urethræ	1	1	..	..	..
" and internal urethrotomy for stricture urethræ	2	1[3]	..	..	..
Bottini's operation for hypertrophic prostate	1	1	..	..	..
Partial amputation of penis for epithelioma	1[3]	..	..	..	1

[1]Closure of bladder by Kader's method, with drainage.
[2]In one case the bladder was at once closed by suture.
[3]In the same patient three operations were performed at one sitting; the fatal issue is recorded under the "partial amputation for epithelioma."

Suprapubic cystotomy was performed six times. In two cases the wound in the bladder was at once closed by three rows of buried catgut sutures, passed Lembert fashion through all the coats but the mucosa. Our experience has been that this method of suture serves as well as any to bring about primary healing of the bladder wound. In the two cases in which it was employed during the past year, primary union occurred in one; an infection of the suture line in the other interfered with faultless primary union. In those cases where only temporary drainage of the bladder is required, the wound in the bladder is closed in the usual fashion, except at one angle where sufficient space is left for the introduction of a good-sized drainage tube. Around this tube the margins of the opening are inverted, Kader fashion, by two or three purse-string sutures of chromicized catgut. After withdrawal of the tube, the walls of the cylindrical channel thus created collapse and so prevent escape of urine.

Bottini's operation for hypertrophic prostate was performed once. The case affords a brilliant example of the beneficial effects that can be accomplished by this operation. Thus far our experience is too limited to permit of drawing any conclusions as to the special indications calling for its performance in preference to prostatectomy, or as to the comparative merits of these two operations.

The history of this patient follows:

1901, vol. iii., page 225. *Hypertrophic Prostate; Bottini Operation; Cured.*—J. B., 72 years old, admitted February 27, 1901. Had been leading a catheter life for six months. Catheterization had become so very difficult during the three weeks before his admission that the patient himself begged for something to be done.

The preparation for the operation consisted in the administration of urotropin in fifteen-grain doses three times daily. The urine was acid, 1032, contained a trace of albumin and much pus. It was impossible to wash out the bladder regularly, on account of the difficulty in passing a catheter. Residual urine, 16 ounces. The patient was otherwise healthy; his temperature was normal, pulse rate 72. The prostate was large, nodular, and firm; the right lobe more enlarged than the left.

March 1: Bottini's operation under $ChCl_3$ anesthesia. Air distension of the bladder. Posterior incision of the prostate, 3½ cm. Two lateral incisions of 1½ cm. each. Slight hemorrhage. Irrigation of the bladder. Drainage with large-sized English catheter. Chill immediately after operation; repeated twice within the next twenty-four hours. Temperature rose to 104.4°, pulse 88-90.

March 2: Temperature between 99° and 100°, and never rose beyond 100.2°. Passed 36-58 ounces of urine daily. No more chills.

March 3: Several sloughs came away from the prostate.

March 6: Out of bed. Passes urine spontaneously.

March 7: Bladder easily entered with Mercier catheter No. 12. Two ounces of residual urine. Still passing sloughs of prostate in the urine.

March 15: Residual urine, 3½ ounces.

March 17: Discharged cured. Passes urine spontaneously. Since leaving hospital he has no residual urine. Urine clear, acid; passes urine easily, and declares he is as well as he ever was.

The histories of two cases of perivesical suppuration follow. No positive cause for the abscesses could be ascertained.

1901, vol. iii., page 196. *Prevesical, Periureteral, and Ischiorectal Abscesses; Sepsis; Incision and Drainage; Death.*—P. B., 45 years old, was admitted May 6. Family tubercular. Denied syphilis and gonorrhea. For ten to twelve years before the present illness he suffered with increased frequency of urination, not accompanied by any pain. For the last four weeks he has had to pass urine very frequently; urination was painful, and only a few drops would be voided at a time. He also had fever, sweating, and chilly sensations. No blood or pus in the urine. Three weeks ago he had an infection of the finger, which had been incised.

On admission, examination revealed numerous crepitant râles at both apices of the lungs. Spleen much enlarged. In the hypogastric and right inguinal regions was a tender mass, irregular in shape, extending from one and one-half inches below the umbilicus to the symphysis. Mass hard, immovable, and slightly fluctuating. Rectally, the mass could be felt bimanually extending from above the prostate forward and outward to the right. On the right middle finger was a healing incision discharging seropurulent material. The rectal mass encroached upon the posterior urethra. Urine acid, clear, 1022, few pus cells, few red cells, no casts, trace albumin. Temperature 102.6°, pulse rate 108.

May 7: Incision and drainage of the mass in the hypogastrium. Ether and gas anesthesia. Mass proved to be extraperitoneal, lay in front of bladder in space of Retzius, and extended laterally to the right and backward to the base of the bladder. It contained about four ounces of thick creamy pus containing in spreads the staphylococcus aureus. Drainage.

The temperature fell after the first twenty-four hours, and continued between 99.5° and 100.5° for eight days, when it again rose to 104°. The wound did not clean and granulate, but remained coated with a grayish membrane. Urine unchanged. On May 17, the ninth day, he had a chill, and temperature rose to 103°. Induration found in ischiorectal space, to the left of the rectum.

May 18: Incision and drainage of ischiorectal abscess, evacuating several ounces of pus. Cavity communicated with original abscess

cavity. Temperature again declined to near the normal and remained so for a week. The general nutrition failed perceptibly, and the wounds were pale and covered with flabby granulations.

May 20: Cystoscopic examination showed vesical mucosa normal. Right ureteral orifice surrounded by deeply congested, slate-colored mucosa. It appears displaced inward and downward. One-half cm. external to it is a retracted area, from the bottom of which pus exuded on pressure. Left ureter appears to be displaced upward and outward. The position of the ureters would seem to indicate a displacement of the neck of the bladder to the left and rotated around a sagittal axis. Blood-tinged, turbid urine was seen to emerge from the right ureter. It would appear, from this examination and our previous data, that the suppuration had taken its origin around the lower extremity of the right ureter, burrowing forward until it involved the prevesical space.

May 26: Temperature again rose to 104°. There was some retention in the ischiorectal abscess cavity. After establishing good drainage the temperature again fell to 99°-100°. The wounds showed no tendency to actively heal or granulate.

June 10: Right kidney to be felt, but not tender. Aspiration through the loin negative. Temperature occasionally rose to 104°. From now on the temperatures daily fluctuated between 97.6° and 104+°. No chills. The general condition, in spite of forced feeding, grew worse; the wounds were covered with pale granulations; bedsores formed over the sacrum. Exitus June 25.

Never any tubercle bacilli in urine. Right kidney never tender.

No postmortem permitted.

1901, vol. iii., page 195. *Perivesical and Perirectal Abscess; Incision and Drainage; Recovery.* I. T., 15 years old, a ragpicker, was admitted May 17, 1901. Had typhoid fever two years before. Three weeks before, he began to have pain in bladder at end of urination. This was so severe that he had to go to bed. Also felt chilly and had some fever. No blood or pus in urine. Bowels moved regularly.

On admission there was a large, tender, globular mass extending from one inch below umbilicus to the symphysis. Rectally a mass was to be felt above the prostate; it gave the sense of fluctuation. Temperature 101.8°.

Immediate operation. Through a median incision above the symphysis, an abscess in the prevesical space, containing about two ounces of thick, non-odorous pus, was evacuated. During rectal examination a large abscess, not communicating with the previous one, and containing fetid pus, was burst open. Drainage of both cavities. Temperature declined to normal and remained so. Gradual closure of both cavities by granulation.

June 9: Above the prostate, lying between the bladder and rectum,

and extending forward at right side of the bladder, is a brawny mass about the size of a lemon, non-fluctuating. Discharged to report for observation. A month later most of this mass had disappeared.

Comments.—Whereas the first of these two cases may have been a metastatic abscess following the infection of the finger, it impressed us rather as a tuberculosis with mixed infection of the seminal vesicle and right ureter. The absence of tubercle bacilli in the urine would seem to point against this assumption.

In the second case we have not been able to assign any cause for the suppuration. There was no evidence of appendicitis.

A complete denudation of the cutaneous covering of the penis, caused by an unskilful circumcision, necessitated a plastic operation:

1901, vol. iii., page 216. *Complete Cutaneous Denudation of Penis; Plastic Operation; Cured.*—I. S., admitted August 20, 1901. The patient stated that the physician pulled the foreskin as far forward over the glans as he possibly could, and then amputated the skin at level of the glans. On relaxation it was found that the entire penis was denuded of its cutaneous covering. Came to the hospital twelve hours later.

August 30: Plastic transplantation of skin from scrotum. Two transverse horizontal incisions, separated by a space corresponding to length of the penis, were made through the skin of the scrotum. The scrotal skin between these two incisions was raised from the underlying tissues. Under the flap thus formed the penis was slipped, and the edges of the flap united to the skin at the root of the penis and to the glans. Rubber tissue was placed between the under surface of the penis and the raw scrotal tissues to prevent adhesion between the two.

September 8: Flap united to dorsum of penis and to base and corona. Division of the pedicle of the flap at either end. The ends of the flap carried around the whole circumference of the penis and united on its under surface. Primary union with slight marginal necrosis.

October 5: Penis entirely covered with skin. No flexion during erection. Discharged cured.

1901, vol. iii., page 223. *Epithelioma of Penis; Stricture Urethræ; Periurethral and Scrotal Fistula; Chronic Bilateral Pyelitis; Chronic Cystitis; Amputation (partial) of Penis; Suprapubic Cystotomy; Perineal Urethrotomy; Death.*—J. T., markedly alcoholic, admitted May 2, 1901. Stricture of urethra of thirty years' standing. Epithelioma of nine months' growth. On admission the cancer involved the entire glans and corona. May 5, 1901, under chloroform, partial

amputation of penis; suprapubic cystotomy and perineal section for division of strictures and drainage. Patient became septic, the pyelonephritis became worse, and death from sepsis ensued May 26, 1901.

1901, vol. i., page 39. *Tuberculosis of Testicle, Vas, Seminal Vesicle, and Prostate; Ablation of Testicle; Resection of Vas, Vesicle, and Half of Prostate; Cured.*—N. M., 36 years old, was admitted November 23, 1900. Never had syphilis or gonorrhea. Had pulmonary tuberculosis six years. Eleven weeks before admission he noticed that the left testicle was enlarged and somewhat painful.

Examination revealed tuberculosis of both lungs. Left testicle enlarged; epididymis hard and nodular. Vas somewhat thickened. Prostate moderately enlarged. Vesicle not felt.

November 26: Ablation of testicle. Resection of entire vas. Resection of vesicle and half of prostate and vas through the perineum. Bladder opened during removal of prostate. Drained through perineal wound. Vas, vesicle, and prostate cheesy. Partial closure of perineal and scrotal wounds. Uninterrupted convalescence. Discharged cured December 19.

DISEASES AND INJURIES OF THE EXTREMITIES. TOTAL, 69; DIED, 3.

Upper Extremity.

	Total.	Cured.	Improved.	Unimproved.	Died.
Fracture of clavicle	1	1	..	..	..
Tuberculosis of clavicle	1	..	..	1	..
Axillary abscess	1	1	..	..	..
Cellulitis of arm and axilla; subpectoral abscess.	1	1	..	..	..
Carcinoma of axillary glands	1	1	..	..	..
Burns of arm	1	1	..	..	..
Fracture of surgical neck of humerus, and Colles' fracture	1	1	..	..	..
Fracture of external condyle of humerus, backward dislocation of ulna, outward of radius.	1	1	..	..	..
Suppurating cubital gland	1	1	..	..	..
Chronic osteomyelitis of ulna	1	1	..	..	..
Dislocation of head of radius in stump of congenital amputation of forearm	1	1	..	..	..
Myxofibroma of forearm	1	1	..	..	..
Suppurating arthritis of elbow joint, probably tubercular	1	..	1	..	..
Recurrent ganglion at wrist	1	1	..	..	..
Traumatic aneurism of superficial palmar arch	1	1	..	..	..
Phlegmon of finger and palm	1	1	..	..	..
Cellulitis of finger	1	1	..	..	..
" " hand, scarlet fever	1	1	..	..	..
" " "	1	..	1	..	..
" " " and forearm	1	1	..	..	..

Lower Extremity.

	Total	Cured	Improved	Unimproved	Died
Carcinoma of ilium	1	..	..	1	..
Suppurating inguinal glands	1	1	..	..	..
Burns of thigh, third degree	1	1	..	..	..
Old dislocation of hip joint	1	..	..	1	..
Oblique fracture of upper third of femur	1	1	..	..	..
Fracture of femur	1	1	..	..	..
Femoral phlebitis	1	1	..	..	..
Phlegmon of thigh	1	1	..	..	..
Tubercular abscess of thigh	1	..	1	..	..
Acute osteomyelitis of femur; synovitis of knee joint	2	2	..	..	..
Acute osteomyelitis of femur, suppurating gonitis	1	1	..	..	..
Chronic osteomyelitis of acetabulum and femoral head; perforation into pelvis with formation of pelvic abscess; secondary perforation into rectum	1	..	..	..	1
Chronic osteomyelitis of femur; secondary fracture of femur	1	1	..	..	..
Chronic osteomyelitis of femur	1	1	..	..	..
" tubercular osteomyelitis of femur	1	..	1	..	..
" osteomyelitis of femur; suppurative gonitis	1	1	..	..	..
Periosteal sarcoma of femur	1	..	..	1	..
Suppurative pretibial bursitis	1	1	..	..	..
Periarticular abscess of knee; bilateral pneumonia	1	1	..	..	..
Volkmann's catarrhal gonitis	1	1	..	..	..
Tubercular gonitis	2	1	1	..	..
Traumatic gonitis	1	1	..	..	..
Fracture of patella	1	1	..	..	..
Rupture internal lateral ligament of knee	1	1	..	..	..
Infected wound of leg	1	1	..	..	..
Cellulitis of foot and leg	1	1	..	..	..
" " leg	1	1	..	..	..
Phlebitis of leg	1	1	..	..	..
Chronic osteomyelitis of tibia	3	3	..	..	..
Defect in tibia following removal of sarcoma	1	1	..	..	..
Compound fracture of tibia following osteomyelitis	1	1	..	..	..
Sarcoma of tibia	1	1	..	..	..
Compound fracture of tibia	1	1	..	..	..
Achillodynia	1	1	..	..	..
Talipes equino-varus paralyticus; post-operative mania	1	..	1	..	..
Lacerated compound fracture of metatarsus and phalanges	1	1	..	..	..
Traumatic gangrene of toes	1	1	..	..	..
Superficial diabetic gangrene of foot	1	1	..	..	..
Diabetic gangrene of toes; ischiorectal abscess	1	1	..	..	..
" " " foot	1	..	..	..	1

	Total.	Cured.	Improved.	Unimproved.	Died.
Suppurating "Charcot's" metatarso-phalangeal joint; streptococcemia; tabes dorsalis	1	..	..	..	1
Chronic gelatinous synovitis of ankle	1	1	..	..	..
Sarcoma of big toe; enlarged inguinal glands	1	1	..	..	..
Tuberculosis of os calcis	1	..	1	..	..
Reynaud's disease; gangrene of foot and leg	1	1	..	..	..
DISEASES AND INJURIES OF SPINE. TOTAL, 5.					
Contusion of spine	1	1	..	..	..
Lumbar abscess, tubercular	2	..	2	..	..
Psoas abscess	1	..	1	..	..
Retroperitoneal abscess	1	..	1	..	..
Operations on Upper and Lower Extremities.					
Operations on Soft Parts.					
Incision and drainage of cellulitis and abscess	18	18	..	..	..
Removal of carcinomatous axillary glands	1	1	..	..	..
" " large myxofibroma of forearm	1	1	..	..	..
Deligation of superficial palmar arch for traumatic aneurism	1	1	..	..	..
Excision of recurrent ganglion at wrist	1	1	..	..	..
Thiersch skin-grafting	3	3	..	..	..
Skin transplantation for plantar defect	1	1	..	..	..
Operations on Tendons.					
Tendon transplantation for paralytic equinovarus	1	..	1	..	..
Operations on Bones.					
Aspiration and injection of ChI_3 for tubercular abscess of femur	1	..	1	..	..
Incision and drainage of pelvic abscess due to spontaneous rupture into pelvis of abscess from osteomyelitis of acetabulum and femur.	1	..	..	..	1
Incision and sequestrotomy for tuberculosis of os calcis	1	1	..	..	..
Osteotomy for chronic osteomyelitis of ulna	1	1	..	..	..
" " " " " femur	3	3	..	..	..
" " " " " tibia	2	2	..	..	..
Beer's osteoplastic operation for osteomyelitis of tibia	1	1	..	..	..
Removal of sarcoma of tibia	1	1	..	..	..
Osteoplastic operation for defect in tibia following removal of sarcoma	1	1	..	..	..

Operations on Joints.

	Total.	Cured.	Improved.	Unimproved.	Died.
Aspiration and injection of psoas abscess	2	..	2	..	..
" " " " lumbar abscess	1	..	1	..	..
" of hematoma of knee joint following fracture of patella	1	1	..	..	..
Aspiration and injection of tubercular arthritis of ankle	1	..	1	..	..
Puncture of tubercular gonitis	1	..	1	..	..
Arthrotomy and irrigation for catarrhal gonitis	1	1	..	..	..
" " drainage for suppurating gonitis	1	1	..	..	..
" " " " " metatarso-phalangeal joint (Charcot); streptococcemia	1	..	..	..	1
Arthrectomy for chronic gelatinous synovitis of ankle	1	1	..	..	..
Resection for tuberculosis of knee	1	..	1	..	..

Amputations and Excisions.

Excision of stump of radius in congenitally amputated forearm	1	1	..	..	..
Amputation of phalanges of four outer toes for lacerated compound fracture of metatarsus and phalanges	1	1	..	..	..
Amputation of thigh for diabetic gangrene of toes	1	1	..	..	..
Amputation of thigh for diabetic gangrene of foot	1	..	..	..	1
Amputation of thigh for acute osteomyelitis of femur and suppurating gonitis	1	1	..	..	..
Amputation of leg (osteoplastic, Beer) for sarcoma of big toe	1	1	..	..	..
Amputation of thigh for Reynaud's disease	1	1	..	..	..

1901, vol. iv., page 357. *Myxofibroma of Forearm; Extirpation; Cured.*—A. M., 15 years old, a student, was admitted August 22, 1901. Four years before, he had been struck on the forearm by a baseball bat. Six weeks later he noticed a small tumor, about the size of a marble, at the site of injury. During the following year this tumor had grown to the size of a walnut. It was removed at one of the city hospitals and pronounced, after microscopical examination, to be a sarcoma. Three months later a recurrence of the growth was noticed, and this was again removed. A second recurrence followed six months later, since which time it has continued to grow.

Upon admission there was a large, hard mass in the right forearm. The mass was spindle-shaped; extended from two inches below the elbow to the wrist joint; projected laterally and in front and behind. It appeared fixed to the bones of the forearm. Radiography showed the tumor to have pushed the bones apart laterally and to have thinned

the ulna very much. The radius was considerably thickened. Flexion and extension at elbow normal; supination and pronation limited to an arc of ten degrees. Axillary glands enlarged, also the inguinal glands.

Though no specific history was obtainable, the patient was put on large doses of KI and inunctions of mercury, with no effect upon the growth. A section taken for microscopical examination was reported to be myxofibroma. A second specimen was also reported to be myxofibroma. Though recurrence had taken place twice, it was deemed advisable to remove the tumor *in loco*, with a wide berth of healthy tissues.

September 20: Under NO_2 and ether the growth was removed. The growth was firmly adherent to the radius and ulna, necessitating removal of the entire anterior and external surfaces of the ulna and anterior and internal surfaces of the radius. The extensor muscles, except the supinator brevis, could be preserved. At the same sitting the axillary glands were removed. Primary union in both wounds. Complete restoration to function of the muscles of the forearm. Supination and pronation completely restored. Pathologists reported the axillary glands to be the seat of chronic hyperplasia, the growth to be myxofibroma.

Comments.—The case is of interest as one of the rare examples of a growth, originally malignant, becoming gradually of a histologically non-malignant type. Secondly, as to whether an amputation, in view of the previous clinical history, should have been performed. It is well known that myxofibromata are clinically of a semi-malignant type, *i.e.*, they recur after removal, and are not encapsulated. Guided by the pathological report, it was deemed advisable to again attempt radical excision. The subsequent history has thus far shown this to be the better course, as no recurrence has been noticed.

1901, vol. i., page 67. *Plastic Operation for Restoring Skin on Plantar Surface of Foot; Cured.*—O. W. had sustained in a railroad accident a lacerated compound fracture of the metatarsus and phalanges, with evulsion of the entire skin and fascia over the distal half of the sole of the foot. After union of the fractured bones and establishment of clean granulations, a transplantation of skin from the calf of the opposite leg to the plantar surface of the injured foot was made. The foot was held in apposition to the leg by plaster-of-Paris dressing, the knee on the affected side being supported on an inclined plane. The transplanted skin took root. The pedicle of the flap was severed on the tenth day. The skin thus transplanted served admirably for walking.

1901, vol. iv., page 310. *Recurrent Sarcoma of Serratus Magnus;*

Extirpation; Cured.—H. G., 15 years old, a pocketbook maker, seven weeks ago noticed a growth just under the armpit. This was removed in the dispensary. A recurrence followed immediately.

On admission, September 26, 1901, there was just below the left axilla a small lump, hard and fixed to the serratus muscle. Glands in axilla and supraclavicular space enlarged.

September 27: Extirpation of tumor and axillary glands. Tumor proved to be a sarcoma involving the serratus magnus.

1901, vol. iv., page 349. *Carcinoma of Axillary Glands; Extirpation; Cured.*—R. F., female, 78 years old, admitted August 7, 1901. Five years before, the patient had a phlegmon of the index finger. Since this time the axillary glands of the corresponding side have been enlarged and painful. For the past four months the swelling of the glands had increased considerably.

On admission there was a hard, fixed tumor in the axilla, encroaching on the breast and pectoral region. Breast gland normal. No other tumor could be located.

August 9: Operation under eucaine anesthesia. Extirpation of the neoplasm and axillary glands. Tumor found to consist of enlarged axillary glands. Pathologist's report: Carcinoma.

DISEASES OF THE BONES.

Too much stress cannot be laid upon the importance of early osteotomy in acute osteomyelitis. Expectant treatment should have here no consideration, for delay of even twenty-four hours is attended with serious risks to the life of the patient, to the integrity of the bone, and to the neighboring joint. Far better is it in doubtful cases to err on the side of early exploratory incision than to wait until blood sepsis or extensive necrosis or pyarthrosis compels the employment of the surgeon's aid. The diagnosis of these cases should rarely be in doubt, if the practitioner will be on his guard. It should be a systematic procedure to examine the epiphyseal ends and shafts of the long bones of all patients, especially children, who are taken suddenly ill with chills and high fever, and in whom no other cause for the symptoms is to be found. Many cases of unexplained sepsis will thus be early accounted for.

Our cases of acute osteomyelitis during the past year show the dire results of expectant therapy. In one boy a serous gonitis and moderately severe general sepsis had occurred by the fifth day. In another a delay of three weeks resulted in extensive necrosis of the lower extremity of the femur, with seropurulent gonitis. In a third a

purulent gonitis, with extensive necrosis of the femur and sepsis, necessitated a final resort to amputation of the thigh in order to save the life of the patient.

Some of these cases manifest from the very onset of the disease a violent type of septicemia. These patients often succumb to the blood poisoning, even though the marrow canal has been opened very early. We must interpret these cases as ones of foudroyant sepsis, in which the local lesions are of secondary importance to the general systemic poisoning.

Our method of procedure in cases of acute osteomyelitis is as follows: The diseased bone is widely opened, into the medullary cavity, and free drainage provided. A serous arthritis of the neighboring joint is not interfered with, as usually such an effusion is spontaneously resorbed when its cause is removed. The more intense types of arthritis are treated by incision and drainage. The Mayo operation for the knee is an excellent procedure for securing rapid and complete drainage. Irrigation with five per cent. carbolic acid, with no drainage, has not been followed by good results.

1901, vol. iv., page 372. *Chronic Osteomyelitis of Acetabulum and Femoral Head, Perforation into the Pelvis; Secondary Pelvic Abscess, Perforation into Rectum; Sepsis; Death.*—E. V., 48 years old, a housewife, admitted October 26, 1901. Fourteen years ago she had an abscess over the dorsum of right ilium, which healed after incision and drainage. Four months before, she commenced to have severe pains in left thigh. No fever or chills. Two months later the pain extended to the left groin, and a swelling appeared in this place. For the last three weeks she had fever and chills.

On admission there was very marked ilio-psoas contraction on the left side. Glandular enlargement in the left groin. Per vaginam a large, hard mass was to be palpated on the left side of the pelvis between the layers of the broad ligament; this mass was continuous with the external glandular swelling. Aspiration of the pelvic swelling yielded pus. Hip joint apparently normal.

October 28: Incision and drainage of pelvic abscess per vaginam and through an incision in left iliac region. The cavity contained foul pus and gas, and appeared to run downward and inward. The abscess cavity continued to discharge a large amount of foul pus. The general condition grew gradually worse, the pulse feebler, and death occurred from chronic sepsis November 28, 1902.

Postmortem examination.—Heart: Fatty infiltration of muscle.

Lungs: Negative.

Spleen: Moderately enlarged. Increase in connective tissue.

Kidneys: Normal.

Liver: Old perihepatitis in right lobe. Nutmeg liver, fatty.

Omentum: Firmly adherent to parietal peritoneum on right side.

Pelvis and Femur: Large abscess cavity in left iliac region, containing foul pus; surrounding muscle tissues necrotic. The outer wall, corresponding to the acetabular cavity, was necrotic and eroded, and the eroded femoral head protruded into the abscess cavity. The part of the ilium adjacent to the acetabular cavity was likewise necrotic. The head, trochanter, and upper fourth of the shaft of the femur were completely necrotic, being grayish and black in color and eroded. Surrounding the diseased bone was much foul pus containing gritty particles. The pus from this latter focus had burrowed upward and backward to the great sacrosciatic notch, and then into the pelvic cavity. There the abscess cavity had perforated into the rectum.

Rectum: Edematous; mucosa hemorrhagic. About 10 cm. from anus, on the anterior wall, four small perforations; three were pinhead in size, the fourth about one-half cm. in diameter.

Uterus and Adnexa were firmly embedded in old adhesions, especially on left side.

Amongst the operations upon joints, the history of the two following cases will be of interest:

1901, vol. iv., page 400. *Suppurating Metatarsophalangeal Joint (Charcot Joint); Tabes Dorsalis; Streptococcemia; Death.*—J. S., 40 years old, admitted October 26, 1901. Had syphilis twenty-one years before. Indefinite tabetic symptoms of gastric crises and shooting pains in legs for the three weeks before admission. The left big toe had been swollen, but not painful, for two months.

On admission the temperature was 103.8°, pulse rate 112. The general condition was fair. Argyle Robinson pupil. Liver and spleen enlarged. Bladder distended to the umbilicus. Two petechial spots in the lower right palpebral conjunctiva, one on abdomen, and three on back. The left metatarsophalangeal joint was swollen, a sinus leading into the joint and discharging foul pus. Necrosis of the joint surfaces. No pain or tenderness in the joint.

October 28: Fresh petechiæ on abdomen and on conjunctiva. Incision and drainage of metatarsophalangeal joint, without anesthesia. Operation not felt by the patient.

October 29: Temperature between 102° and 104.8°. Blood on culture reported to contain streptococci.

October 30: Left shoulder joint painful and swollen. Patient markedly septic. Temperature 103°-104°. Left eye: Cornea hazy; marked injection of iris and sclera; panophthalmitis.

November 1: Death from acute sepsis.

1901, vol. iv., page 401. *Chronic Gelatinous Synovitis of Ankle Joint; Arthrectomy; Cured.*—M. E., 4 years old, previously healthy, cut his foot on a bottle four weeks before his admission. The ankle be-

came swollen and has grown progressively worse. The child is sick and in pain. Had some fever, no chills, no cough.

On admission, July 4, 1901, the right ankle was swollen and edematous. On the inner aspect a small, granulating wound, from which a sinus leads inward to the joint. No bare bone to be felt. From the sinus some seropurulent fluid was discharged. No motion in the joint.

July 5: Arthrectomy. Joint exposed by Langenbeck incisions. Both malleoli removed. Periarticular tissues showed gelatinoid degeneration, similar to tuberculosis. The synovial membrane of the joint and all the tendon sheaths were the seat of the same gelatinous degeneration. All the diseased tissues were excised. Joint and periarticular structures washed with iodoform-glycerin. Pathologist reported the tissue to be *non-tubercular.*

August 14: *Wounds healed. Motion in ankle through an arc of* 15°.

One death from amputation of the thigh for diabetic gangrene of the foot occurred. His history was:

1901, vol. iv., page 398. *Diabetic Gangrene of Foot; Amputation of Thigh; Death.*—A. B., 50 years old, a dressmaker, was admitted May 15, 1901. Had diabetes many years. Four weeks before, he experienced a sensation of numbness and coldness in the left leg. One week later a discoloration of the foot appeared. The foot rapidly became black and swollen.

On admission there was a well-defined dry, gangrenous area on the foot and ankle. Both legs edematous; marked lymphangitis in the left leg. Pulsation in both femorals and popliteal arteries. Urine 1.4 per cent. sugar, albumin and casts.

May 17: Amputation in middle of thigh. Soft parts markedly edematous. Wound packed.

May 21: Chill, and temperature rose to 105.2°. The wound looked well; discharge moderate.

May 22: Temperature 100 +°, and remained so for the next ten days.

May 24: The fascial planes in the stump all suppurating. Counter-incisions and drainage.

June 1: Temperature daily rose to 102 +°. Profuse suppuration in the muscles and fasciæ of the stump. Gradual emaciation. Urine 1 per cent. sugar, albumin and casts. Patient gradually became more and more septic, and died of exhaustion June 17, 1901.

Examination of leg amputated.—Popliteal artery at its bifurcation quite small, entirely closed by decolorized, firm, canalized thrombus which extended into the anterior tibial artery. Posterior tibial artery empty. Above the thrombus the popliteal artery contained a recent dark-red, non-adherent clot. Femoral vein empty. All the small veins leading from the gangrenous area distended by soft, non-adherent, dark-red thrombi.

MISCELLANEOUS DISEASES. TOTAL, 11.

	Total.	Cured.	Improved.	Unimproved.	Died.
Actinomycosis of chest wall and back	1	..	1	..	..
Anemia	1	1	..	..	..
Erythema nodosum	1	1	..	..	..
Fever	Transferred to medical service				
Furunculosis	1	1	..	..	..
Neurasthenia	2	..	2	..	..
Pregnancy pains	1	..	1	..	..
Gonorrheal rheumatism	1	1	..	..	..
Scleroderma	1	..	1	..	..
Typhoid fever	1	1	..	..	..

Operations.

Curettage of actinomycosis of chest and back	1	..	1	..	..

REPORT OF THE DEPARTMENT OF GENERAL SURGERY FOR 1902.

REPORT OF THE FIRST SURGICAL DIVISION.

ARPAD G. GERSTER, M.D.,
ATTENDING SURGEON.

A. A. BERG, M.D., AND A. V. MOSCHCOWITZ, M.D.,
ADJUNCT SURGEONS.

HEAD AND NECK. TOTAL, 41; DEATH, 1.

	Total.	Cured.	Improved.	Unimproved.	Died.
Abscess of parotid gland	1	1	..	..	..
Adhesions of palate and pharynx	1	1	..	..	..
Alveolar sinus, persistent	1	..	1	..	..
Burns of face	1	1	..	..	..
Carbuncle of neck	2	2	..	..	..
Carcinoma of the lymphatic nodes of the neck	2	1	..	1	..
" " " larynx	1	..	1	..	..
" " " tonsil	1	..	..	1	..
Dacryocystitis	1	..	1	..	..
Epilepsy, Jacksonian	1	1	..	..	..
Fracture of frontal bone, depressed; gunshot wound	1	1	..	..	..
Glaucoma (sympathectomy)	2	..	2	..	..
Lymphadenitis of neck, suppurating	3	3	..	..	..
" " " tuberculous	6	6	..	..	..
Neuralgia of trigeminal nerve	3	1	1	1	..
Osteomyelitis of inferior maxilla	2	1	1	..	..
Papillomata of vocal cords	1	1	..	..	..
Saddlenose, traumatic	1	1	..	..	..
Sarcoma of superior maxilla	1	1	..	..	..
" " inferior maxilla	2	2	..	..	..
" retrotonsillar	1	..	..	1	..
Thyroid cyst	5	3	..	1	1
Thyroglossal duct, persistent	1	..	..	1	..

The histories of a few of the cases are given either because of their rarity or because they offer especial points of interest.

GLAUCOMA. TOTAL, 2.

Two cases of resection of the superior cervical ganglion of the sympathetic nerve for intractable glaucoma occurred. It was observed that in both instances the tension of the eyeball did not diminish; the concomitant symptoms, however, namely, the headache and vision, were somewhat improved.

NEURALGIA OF THE TRIGEMINAL NERVE. TOTAL, 3.

Of three patients suffering from trigeminal neuralgia, one was discharged unimproved. His poor general condition forbade operative procedure. In the second case such improvement followed the symptomatic treatment that the patient asked for his discharge. In the third case, severe trigeminal neuralgia was cured by the extirpation of the Gasserian ganglion.

CYSTS OF THE THYROID GLAND. TOTAL, 5; DEATH, 1.

Five cases of cysts of the thyroid gland presented themselves for treatment. Of these, in three cases operations were done successfully In one case operative interference was declined. In the fifth case the patient died upon the operating table at the moment when the skin was being incised. Autopsy revealed a well-marked status lymphaticus. The history of this case is as follows:

1902, vol. iii., page 526. *Cyst of the Thyroid Gland; Death from Anesthesia.*—Camilla A., 24 years of age, was admitted to the medical side of the hospital on October 26, 1901, with the following history: Family and past history negative. For the past two years patient had been complaining of cardiac palpitation. Three months prior to her admission to the hospital she began to notice an enlargement of the neck, which has gradually increased. She also complained of headache, weakness, and extreme irritability. A flushed face, but no ocular changes, were noted by herself.

Physical examination revealed the presence of a moderate exophthalmos and a goitre of the size of a hen's egg. A coarse tremor of the hands and tongue was present. The patellar reflexes were increased; slight ankle clonus. The tonsils were enlarged.

During her stay on the medical side of the hospital the thyroid tumor increased in size until the circumference of the neck, at the level of the tumor, measured 40 cm. She was treated with various remedies, but absolutely without effect. Finally, January 8, she was transferred to the surgical side.

Chloroform was administered, and was well borne until the moment

when the first incision was made. Just as this was finished the patient became cyanosed. Artificial respiration and vigorous hypodermatic and intravenous stimulation were at once instituted, but failed to restore the patient. The collapse was distinctly cardiac, as respiration continued several seconds after the pulse had become imperceptible.

Autopsy revealed the following condition: Lymph nodes enlarged all over the body; they are soft, pale in color, not amalgamated. Tonsils very large. Adenoids present; very large amount of adenoid tissue at base of tongue. Lateral lobes of the thyroid gland enlarged; some enlargement of the central lobe also. Thymus very large; the right lobe is larger and extends over the upper part of the right ventricle; it is soft on section; its weight is 85 gm. In other respects the postmortem examination was negative.

THORAX. TOTAL, 22; DEATHS, 5.

	Total.	Cured.	Improved.	Unimproved.	Died.
Fibroadenoma of breast	1	1	..	..	..
Carcinoma of breast	8	5	..	1[1]	2
Fracture of ribs	1	..	1	..	..
Tuberculosis of ribs	2	1	..	..	1
Osteomyelitis of ribs	2	2	..	..	..
Actinomycosis of ribs and sternum	1	1	..	..	..
" " recurrent	1	1	..	..	..
Empyema of pleura	1	1	..	..	..
Chronic sinus after operation for empyema	2	1	1	..	..
Carcinoma of esophagus	3	..	1	..	2

CARCINOMA OF BREAST. TOTAL, 8; DEATHS, 2.

Eight cases of mammary carcinoma were admitted during the past year. One of these was discharged unimproved, as it was considered inoperable; in the remaining seven a radical operation was attempted. Our choice of operations is the Halsted method, removing *in toto* the breast, axillary contents, and pectoralis major and minor. Five of the seven cases operated upon in this manner were discharged cured temporarily, while two of the cases died. Of the latter, one case (1902, page 320) died most probably of shock following upon the operation; while the second case (1902, page 317) died of metastasis in various parts of the body. The histories of the two fatal cases are hereby appended:

1902, vol. ii., page 320. *Carcinoma of Breast; Amputation of*

[1]Not operated upon.

Breast; Removal of Axillary Contents and of Both Pectoral Muscles. Death from Shock.—Helen R., 54 years of age, was admitted to the hospital on August 11. Family and past history negative. About eight months ago patient noticed a small lump in the right breast, which up to three months ago has gradually increased in size; since then it has been stationary.

On examination there was found in the upper outer quadrant of the right breast an infiltrating mass with indefinite outline, and with strands of hard tissue running out of its periphery. The nipple was retracted, the skin not adherent, and the entire breast was freely movable on the deep tissues. In the corresponding axilla there were to be palpated many glands, apparently matted together, and adherent to the skin; some enlarged glands also in the right supraclavicular space and along the outer border of the right sterno-mastoid. Examination of the other organs negative.

Operation August 15, gas and ether; Halsted's method. On account of the intimate relation of the carcinomatous glands to the axillary vein, the requisite dissection was exceedingly laborious. Toward the end of the operation patient collapsed, requiring vigorous stimulation, to which there was no response. An intravenous infusion also was useless, and she died about eight hours after the operation.

An autopsy was not permitted.

1902, vol. ii., page 317. *Carcinoma of Breast; Operation, Radical Extirpation of Breast, Axillary Contents, and Both Pectoral Muscles; Death, nearly three months later, from Metastases.*—Louise G., 38 years of age, was admitted to the hospital November 26, 1901, with the following history: She noticed a lump in the right breast about twenty years ago, but, as it did not cause physical discomfort, she paid no attention to it; nor does she know whether the tumor has increased in size or not. The malignant nature of the growth was accidentally discovered by her physician four days ago, who advised immediate operation. In addition the patient complains of pain in the region of the left shoulder.

On examination there was found an extensive *cancer en cuirasse* of the right breast. Nothing abnormal found about the left shoulder joint, though the principal complaint of the patient concerned this joint more than the breast. The tumor in the right breast was very large, so much so that an operation was at one time thought inadvisable; but it was finally attempted, with the intention of going wide of the mass.

Operation November 29. Amputation of the breast, removal of the axillary contents and of both pectoral muscles. The involvement of the axilla was very extensive, requiring very painstaking dissection. The necessarily large incision could be closed only in part, leaving an area about the size of a palm, which was immediately covered by Thiersch's grafts. Primary union.

Two days after the operation a spontaneous fracture of the left humerus occurred, and was presumably due to a metastasis; but ultimately good union and function were obtained.

About one month after the operation metastatic carcinoma of the left pleura developed. Then a carcinomatous deposit, situated in the tenth dorsal segment of the spinal column, appeared, and was followed by metastases in the peritoneum. Finally patient died of sepsis, due to the usual infection of the genitourinary tract, on February 18, 1902.

No autopsy was permitted.

TUBERCULOSIS OF THE RIBS. TOTAL, 2; DIED, 1.

One case was cured by resection; in the other the posterior mediastinum was also involved. This case terminated fatally soon after an extensive thoracoplasty.

1902, vol. ii., page 324. *Tuberculosis of the Ribs and Posterior Mediastinum; Multiple Resections; Death.*—Abraham B., 17 years of age, was admitted to the hospital March 22 with the following history: About four months prior to admission patient noticed a slight swelling between the spinal column and inner border of the scapula; this swelling gradually and slowly increased in size, but did not occasion any pain or discomfort until two weeks ago. At this time he began to have also slight chilly sensations and fever.

The local condition at the time of admission was the following: In the left subscapular region, and with its long axis in the direction of the ribs, there was a large ovoid mass, reaching from about two inches from the median line outward to the posterior axillary line, and approximately from the sixth to the ninth rib. The mass was smooth and tender, and fixed upon the deeper structures, but the skin was movable over it. It fluctuated and gave a distinct impulse on coughing. The dorsal spine was somewhat rigid, and there was tenderness over the spinous process of the fourth dorsal vertebra. Temperature 102.6°, pulse 108, respiration 28.

Immediate operation. Incision of the abscess. The finger passed through a large, irregular opening into an enormous cavity situated within the thorax. Part of its outer wall was formed by the dorsal portion of the necrotic seventh rib; the spinal third of this rib, including its articular end, was therefore extirpated. Evacuation. Tube and gauze drainage.

Probably suppuration had begun on the anterior surface of the rib near its articulation. The abscess had gradually burrowed between the parietal pleura and the lower ribs. Thus the detached pleura was forced inward, downward, and forward against the lung and the diaphragm, where it had formed an intrathoracic but extrapleural abscess. Rupture externally through the intercostal muscles was probably coincident with the appearance of a tumor on the chest wall.

At first the post-operative course was very encouraging, but about a month later signs of retention became evident: this necessitated the resection of a portion of two more ribs on April 24.

Again, as after the first operation, the condition of the patient improved, but an intractable sinus remained: in addition another large cold abscess appeared, requiring surgical intervention. On June 9 the abscess was incised and about ten ounces of thick, creamy pus were evacuated. The sinus from the previous operation was also laid wide open, but not found to be communicating with the abscess just incised. An attempt was made to resect the overlying ribs, but, owing to the poor general condition of the patient, it was deemed more prudent to defer further steps to a later date.

On July 11 the condition of the patient seemed to justify free exposure of the large cavity. Ether anesthesia. The ribs forming the roof of the abscess cavity were rapidly resected and its contents evacuated. Though the operation was very extensive, it did not require much time for its completion. The patient, however, rallied poorly after the operation: he was in a semi-stuporous condition, without regaining full consciousness. On the following morning patient had a general convulsion and directly thereafter died.

A wound examination only was obtained, and this showed the abscess to be situated extrapleurally: it extended downward to the diaphragm, and anteriorly in close proximity to the heart.

CARCINOMA OF THE ESOPHAGUS. TOTAL, 3; DEATHS, 2.

The three cases of carcinoma of the esophagus were all treated by gastrostomy, which was performed by Kader's method. No leakage occurred in any of the cases, and no annoying eczemata were ever noted. One case (1902, page 6) was discharged with a well-functionating fistula. Two of the cases (1902, pages 7 and 8) died in the hospital one month and twenty-three days respectively after operation.

1902, vol. i., page 7. *Carcinoma of the Esophagus; Operation, Gastrostomy (Kader); Death.*—Annie F., 60 years of age, was admitted to the hospital February 17 with all symptoms of a carcinomatous obstruction of the esophagus of six months' standing. Operation February 21. On March 1 the edges of the wound separated during a fit of coughing, but no serious consequences followed. The gastric fistula worked well. March 7, pulmonary edema and death.

Only a partial postmortem examination was permitted. It did not reveal anything worth noting.

1902, vol. i., page 8. *Carcinoma of Esophagus; Operation, Gastrostomy (Kader); Death (Abscess of Lung, Malignant Endocarditis).*—Jacob H., 43 years of age, was admitted to the hospital July 14, 1902. Patient dates back the beginning of his illness fifteen months, when

painful deglutition was noted, the pain ceasing immediately after the entrance of the bolus into the stomach. Since about three or four weeks he has been regurgitating; no bloody vomit, not even after attempts to pass a stomach tube. Appetite good. Had lost much weight and strength.

On admission the following status was found: General condition good. Moderate enlargement of the supraclavicular glands. Attempts to obtain a test meal were vain, because no stomach tube could be passed. A bougie, No. 29 F., was arrested at a distance of 13 inches from the teeth; No. 22 was arrested at 15 inches; No. 15 apparently entered the stomach.

July 18: Gastrostomy performed after the method of Kader. Perfect primary union resulted, with an excellent function of the gastric fistula; none of the subsequent symptoms were in any way connected with the wound.

On the 22d diffuse bronchitis set in, with exceedingly fetid expectoration. No doubt this was due to the decomposing secretions above the stenosis. An attempt was made to wash out the esophagus above the constriction, but such violent coughing resulted that the tube had to be withdrawn. The end of the tube was covered with a fetid, bloody discharge; in the eye of the tube a small particle of tumor was found, which on subsequent examination proved to be epithelial carcinoma.

The patient continued to have high temperatures. A blood culture taken on August 1 revealed the presence of streptococci. On August 3 petechiæ were found in both lower conjunctivæ, and on the same day a distinct diastolic murmur was heard. Antistreptococcus serum and Credé inunctions were employed, but neither had any effect on the progressive sepsis, and patient died August 8.

Postmortem examination revealed the following conditions:

Esophagus: At the bifurcation of the trachea there was an ulcerating annular carcinoma, reaching downward for 8 cm., destroying the mucosa, and on one side ulcerating through all the walls to the hilus of the lung. In the hilus there was an abscess cavity about 4 cm. in diameter. Irregular infiltration of the esophagus down to the cardia, which just admitted the tip of the index finger. At the site of the main growth the obstruction was complete.

Lungs showed congestion and adhesions.

Heart: Fatty overgrowth; slight vegetations on all the valves, large vegetations on the aortic flaps; the mitral valve shows vegetations and purulent foci. Heart muscle soft and flabby.

Mediastinal and bronchial nodes: Enlarged.

Kidneys: Negative.

Liver: Enlarged; in the right lobe a metastatic carcinoma.

Intestines showed congestion and petechiæ from the ileum downward.

Mesenteric nodes were enlarged. Nodes about the pylorus showed a metastatic growth.

DISEASES OF ABDOMINAL VISCERA—203 PATIENTS; 176 OPERATED UPON; 187 OPERATIONS, 38 DEATHS (4 DEATHS IN PATIENTS NOT OPERATED UPON).

	Total number of cases.	Number of cases operated.	Number of operations.	Deaths. Operated	Deaths. Not operated
Diseases of stomach	16	12	15	5	..
" " small and large intestines	21	17	18	8	1
" " vermiform appendix	101[1]	94	95	9	1
" " liver	12	10	11	3	1
" " gall bladder and bile ducts	21	16	21	5	..
" " pancreas	4	3	3	1	1
" " female genital organs	17	16	16[2]	2	..
Miscellaneous abdominal diseases	11	8	8[3]	1	..
	203	176	187[4]	34	4

DISEASES OF STOMACH—16 IN 15 PATIENTS; 5 DEATHS.

	Total	Cured	Improved	Unimproved.	Died.
Gastritis and cholecystitis[5]	1	..	1	..	..
Foreign body (stomach tube) in stomach	1	1	..	..	..
" " (Murphy button) in stomach[6]	1	1	..	..	..
Spastic pyloritis[6]	1	..	..	1	..
Spastic stricture of pylorus, probably due to open ulcer	1	1	..	..	..
Stenosis of opening following gastroenterostomy[6]	1	1	..	..	..
Benign stenosis of pylorus	2	2	..	..	..
Gastric ulcer; peripyloritis; diffuse adhesive peritonitis	1	..	..	..	1
Perforated ulcer of stomach; diffuse peritonitis	1	1	..	..	..
Carcinoma of stomach and esophagus	1	..	1	..	..
Carcinoma of pylorus	4	..	..	1	3
" " stomach; perforation; diffuse peritonitis	1	..	..	..	1
Operations on Stomach—15 Operations; 12 Patients; 5 Deaths.					
Gastrotomy; immediate suture	2	2	..	..	..
Gastrostomy for carcinoma of cardiac orifice	1	1	..	..	..
Pyloroplasty, Heineke-Mikulicz	1	1	..	..	..
Plastic operation on stenosed gastroenterostomy opening	1	1	..	..	..

[1]Appendix was removed in a number of patients in whom the abdomen was opened for diseases other than that of the appendix vermiformis.
[2]Fourteen of these operations were laparotomies.
[3]Four of these operations were laparotomies.
[4]One hundred and eighty-one of these were laparotomies.
[5]Transferred to medical side.
[6]Same patient readmitted.
[7]Not operated upon.

	Total.	Cured.	Improved.	Unimproved.	Died.
Gastroenterostomy for benign stenosis.....	2	2	..	..	..
Gastroenterostomy and enteroenterostomy[1].....	1	1	..	..	..
Gastroenterostomy for carcinoma of pylorus.....	3	..	..	..	3
Closure of perforated gastric ulcer.....	1	1	..	..	..
" " " carcinoma of stomach....	1	..	..	..	1
Laparotomy for division of intestinal adhesions,[1] following gastroenterostomy and entero-enterostomy	2	1	..	..	1

A number of the patients included in the above classification presented problems of so much importance and interest to this branch of surgery that their clinical histories and a few comments upon them will be in place.

1902, vol. i., page 22. *Foreign Body (Stomach Tube) in Stomach of a Baby; Gastrotomy; Cured.*—Louis C., 2½ years old, on the evening before his admission was lavaged by a physician on account of an acute gastritis. The washing was done with a tube 19 inches long and 22 F. in calibre. During the manipulations the struggles of the child caused the stomach tube to part from the glass canula by which it was attached to an accessory tube bearing a funnel. As no one was holding the intragastric tube, the child easily gulped it down. An emetic was at once given, but the vomiting that it produced did not bring up the tube. Two repetitions of this emesis were equally unsuccessful. When the child was seen in consultation, several hours after the accident, the tube was easily to be seen in the stomach through the lax abdominal walls, coiled up in U-shape, the convexity of the U at the cardiac orifice and the two extremities at the fundus. Surgical interference was advised, and accepted by the parents. The following morning the abdomen was opened by small incision through the left rectus muscle, the stomach drawn up into the wound, surrounded by protective barriers of gauze, incised for one-half inch on its anterior wall, and the tube removed. The stomach was closed by two rows of mattress Lembert sutures. The abdomen closed without drainage. Uneventful convalescence.

Comments.—The advisability of surgical interference in this case comes up. Against it may be urged that the tube may possibly have passed *per vias naturales,* if it succeeded in getting through the pylorus; that as long as it remained in the stomach it would produce no material damage, except possibly to cause vomiting, in which case it could be removed. On the other hand, reasoning from analogy of other hollow viscera—*e.g.*, the urinary bladder, which, under far

[1]Same patient.

more favorable conditions, is unable to expel foreign bodies, such as catheters—it seemed to us unlikely that the stomach would be able to propel this tube, especially considering the position in which it lay, through the pylorus; and, further, that we could by no means be certain, even if the tube entered the intestine, that it would pass through this entire tract without kinking and giving rise to obstructive symptoms; and, lastly, in the event of the tube giving rise to obstruction or persistent vomiting, the prognosis from operative interference undertaken at such a time would be materially worse than that of a simple gastrotomy performed in a healthy baby. The parents accepted the surgeon's views and, as the outcome proved, to their entire satisfaction.

The possibility of a recurrence of such an accident should warn us to either affix a guard to our stomach tubes, or never to trust to the patient to hold the tube that goes down into the stomach.

Gastroenterostomy for pyloric stenosis was performed six times: thrice for benign stenosis and thrice for malignant obstruction of the pylorus. In five gastroenterostomy alone was done; in one this was combined with enteroanastomosis.

The posterior operation of Von Hacker is performed as a routine procedure, the anterior anastomosis being resorted to only where the former is not applicable, *e.g.*, in extensive carcinomatous infiltration of the posterior gastric wall, or where the transverse mesocolon is very short. The *opening* into the *stomach* is made *at its lowest point*. To this portion of the technique we ascribe our not having experienced the establishment of the so-called vicious circle vomiting. The opening into the jejunum is made about 15 inches from the duodenal junction. The junction is made so that the stomach and jejunum lie in isoperistaltic direction. The anastomosis is always made with the aid of Murphy's button. Up to within a short time ago the segments of the button were held in place by a purse-string suture of silk going through all the coats of the stomach and intestine. Within the past two years we have had two cases in which the button was retained in the anastomotic orifice, exciting by its presence persistent vomiting. In one the vomiting ceased when the button was removed; in the other, the last case, the excision of the button did not relieve it; a third laparotomy revealed the persistent cause thereof to be a contraction of the anastomotic orifice, probably due to the cicatrization of a pressure ulcer that had been caused by the button. A plastic operation upon the new opening relieved the symptoms. His history was:

1902, vol. i., page 23. Four months prior to his readmission he had been operated upon for benign pyloric stenosis, the posterior gastro-enterostomy with Murphy's button being performed. He had gained 25 pounds in weight. During the four or five weeks before his readmission on December 4, 1901, he vomited everything he ate or drank. Fluids were returned immediately; solids somewhat later. The button had never been passed. Physical examination, December 4, was negative, except for some tenderness in the umbilical and epigastric regions. No locomotor ataxia. Urine normal. He belched continually and vomited everything he took into his stomach. Lavage did not check the vomiting. The washings were clear; there was no stagnation in the stomach. As the patient could not retain a test meal, no chemical examination of the gastric secretions could be made. The vomitus was always acid. X-ray examination did not reveal the presence of the button.

December 7, 1902: Laparotomy. Numerous omental adhesions to the scar. Jejunum firmly joined to the stomach, and surrounded by few thin adhesions. No tumor of the pylorus, which was much contracted. Upper coil of jejunum much distended. No angulation of jejunum. The button was easily palpated in the anastomotic orifice. The stomach was delivered from the wound and surrounded by gauze protective barriers. Its anterior wall near the greater curvature was incised. The button was found to be grasped in a cicatricial ring on the gastric side of the anastomosis, from which it was impossible to deliver it. Division of the cicatricial ring by prolonging the incision that had been made into the stomach downward, permitted the button to be easily removed. Closure of the opening into the stomach by two rows of Czerny-Lembert and Lembert sutures. . Closure of abdominal wound with drainage. The vomiting of food and drink persisted in spite of lavage; it was not biliary. When nothing was taken into the stomach there was no vomiting. Dietary and medicinal means were tried, with no avail, and on January 21 he had to be reoperated. Laparotomy. Fresh adhesions of omentum and anterior gastric wall to the scar and at site of the anastomosis. The anastomotic orifice was found much contracted, scarcely admitting the tip of the index finger over the inverted gastric wall. Plastic operation according to Heineke-Mikulicz upon the anastomotic orifice. A longitudinal incision was made along the anterior aspect of the anastomosis, the centre of it being over the orifice of communication. This longitudinal incision was then united in a transverse diameter by two rows of Lembert sutures. Closure of abdominal wound, with drainage. The vomiting continued for several days, then ceased, the patient making an otherwise uneventful convalescence, and was discharged cured March 19, 1902.

Retained Buttons.—The causation of retained buttons within the anastomotic orifice has not been entirely explained. In some cases it is undoubtedly due to a faulty instrument. An examination of the

buttons offered for sale by one of our large instrument houses revealed the fact that a large proportion of them did not close perfectly and consequently could not have exerted sufficient pressure upon tissues included between their segments to have brought about necrosis. It is evident that where this is incomplete the button must be retained *in situ*. Incomplete necrosis due to technical errors will also explain the causation of retention of the button. In 1898 Carle and Fantino drew attention to the imperfect apposition of the button segments, due to the puckering of the thick gastric wall by the purse-string suture. This imperfect apposition necessarily carries along with it an imperfect and incomplete necrosis, and, since our experience with two instances of retained buttons, we have abandoned the purse-string suture and now follow the suggestion of Carle and Fantino—viz., to introduce the button through as small an opening as possible and close the latter snugly around the shaft with a few Lembert sutures. This affords smooth, flat surfaces for apposition, and the pressure is consequently equal at all points.

The history of the above case also shows that the retention of the button within the anastomotic orifice may cause its contraction, either by giving rise to a pressure ulcer in its immediate vicinity, the cicatrization of which narrows the orifice, or by not originally causing sufficient necrosis to establish a proper sized communication between the joined viscera.

After-treatment.—Fluid nourishment is given in small quantities after twenty-four hours. Soft, mushy food is allowed after seven days.

Vomiting has often been noted for two or three days after operation, the vomitus consisting of bile and watery material. Gastric lavage is instituted in these cases at once, and repeated every six to eight hours if necessary. To this, as well as to establishment of the anastomosis at the lowest level of the stomach, we have ascribed the avoidance thus far in our cases of the vicious circle vomiting. We have never experienced any bad results in our cases from gastric lavage, even when it has had to be done within the first twelve hours following operation.

In a number of our cases, in which the general nutrition of the patients before operation was very poor, we have experienced a bursting open of the abdominal wound as late as ten days after operation. To avoid this accident we are now accustomed to leave the sutures in place for fourteen days. A similar experience in patients of low

vitality, operated upon for other conditions than pyloric stenosis, has led us to adopt this practice of leaving in the abdominal sutures for a fortnight in all patients of this type.

The three deaths, during the past year, following gastroenterostomy were in patients with malignant stenosis; in one, death was due to pneumonia and asthenia; in one, to peritoneal septicemia; and in one, to shock. The fatal case of gastric ulcer, peripyloritis, and diffuse adhesive peritonitis was a most peculiar and unique one.

1902, vol. i., page 11. *Gastric Ulcer; Peripyloritis; Posterior Gastroenterostomy, Enteroenterostomy; Recovery; Subsequent Persistent Vomiting from Formation of Extensive Peritoneal Adhesions; Laparotomy; Division of Adhesions; Recovery; Reformation of Adhesions causing Recurrence of Vomiting; Laparotomy; Death.*—Betsy B., 22 years of age, had been operated upon in Vienna for some gastric trouble two and one-half years before. After the operation she was fed through a gastrostomy (?) wound for five months, when the opening into the stomach was closed by suture. She left the hospital in Vienna feeling well, and remained so for one year. Five weeks before admission she was seized with epigastric pain radiating to right side and back. For the last twelve days she vomited everything she ate or drank. There was no pain after eating, but almost immediate nausea and vomiting. No hematemesis. No blood in stools. Several chills occurring with attacks of severe pain.

On admission, January 29, 1902, there was a laparotomy scar in epigastrium; exquisite tenderness over pylorus, where a mass of adhesions (?) was to be felt. Stomach by percussion was dilated upward. On administering milk it was returned within thirty seconds, coagulated and acid. Stomach tube was easily passed through the cardia.

January 30: Patient vomited fresh blood, and again on January 31 she vomited two ounces of fresh blood.

For a week she was fed exclusively per rectum. Pain and vomiting continued. Temperatures between 99° and 100.8°, pulse rate 70-90. Urine contained a trace of albumin, no casts. White blood cells, 10,300.

February 7: Transferred to the surgical side for operation. Laparotomy for gastric ulcer and peripyloritis. Incision through scar of previous operation. Numerous firm adhesions between intestines, and especially between the under surface of the liver, gall bladder, and pylorus. Though evidences of healed pyloric ulcers were visible, no recent ulcer could be located. The pylorus was much injected. The jejunum was firmly adherent to abdominal parietes, from which it was inferred that at the previous operation a jejunostomy had been performed. In prolonging the incision downward the adherent loop of jejunum was incised. It was at once freed and the rent repaired. This narrowed the lumen of the segment very materially. After further separation of adhesions, a posterior gastro-

enterostomy with Murphy's button was established, and in order to overcome the narrowed loop of jejunum an enteroenterostomy was performed, thus excluding this loop of intestine. Through-and-through abdominal sutures. Drainage. The patient, though in very wretched condition, bore the operation nicely. She vomited a bile-stained fluid for several days, but after repeated lavage this ceased. The wound healed slowly; several stitch holes became infected.

February 22: Patient was out of bed; felt well; no pain; no vomiting; takes solid food; had not passed the buttons. She remained well until March 9, when she again commenced to vomit.

March 11: Passed one button (thirty-second day).

March 19-25: Vomited at times. General condition good.

March 27: Vomiting very frequently—large amounts of greenish material. Patient was rapidly losing ground. On this account it was decided to reopen the abdomen, supposing that either a contraction of the gastroenteric orifice or an impaction of the Murphy button was the cause of the persistent vomiting.

March 27: Laparotomy for post-operative adhesions. Incision through old scar. Numerous intimate adhesions were encountered, matting together into an intricate mass the small intestines and stomach. The separation of these adhesions was cautiously done, but nevertheless a loop of jejunum was incised. Immediate repair. Examination of the gastroenteric anastomosis showed no impacted button, nor could the button be felt in the stomach. The orifice was not contracted, easily admitting two fingers. The enteroenteric anastomosis was likewise firm and its orifice adequate. The button was not impacted. The loop of jejunum which had been incised at the previous operation, and doubts of whose sufficient patency were had at the time, was examined and found to be of adequately large lumen. The loops of ileum were much contracted, whereas the jejunum was distended. After freeing all the adhesions the lower coils of small intestines became distended. It was therefore presumed that the adhesions were the cause of the vomiting, and after a further unsuccessful search for the button the intestines were replaced and the abdomen closed.

April 1: Again the patient vomited for several days, but this stopped and immediately the patient commenced to gain flesh and strength.

April 21: She developed mastoid disease, necessitating opening of mastoid.

May 16: Vomiting again; gradually became more frequent until she retained no food. Gastric lavage did not check the vomiting. Rapidly failing in strength.

May 22: *Repeated vomiting and poor condition necessitated a third interference.* Incision through old scar. Findings were practically identical with those at the previous operation; dense intimate adhesions of all the intestinal coils to each other. The lower portion of the ileum was collapsed; the upper loops of jejunum were in part collapsed and in part distended. Numerous kinks due to adhesions were

straightened out. The adhesions were separated; they were too extensive to permit of being covered with Cargile membrane. The intestine below the enteroanastomosis was fixed into the abdominal wound so as to enable the patient to be fed through a jejunal fistula, if this was necessary. Closure of rest of wound. Vomiting persisted and did not subside after lavage.

May 23: The intestine in the wound was opened, but a catheter could not be passed into it a sufficient distance to enable nourishment to be given in this way. Vomiting continued.

May 24: During an attack of vomiting the small intestines were crowded out of the lower angle of the wound. They were immediately replaced. Soon after this the patient collapsed and died—a most sorrowful termination after so much heroic courage and suffering.

1902, vol. i., page 15. *Carcinoma of Pylorus; Posterior Gastroenterostomy; Peritoneal Septicemia; Death.*—Celia B., 55 years old, suffered with gastric trouble for two years. For six weeks before admission she vomited all ingesta. For weeks before admission she could not even retain water. No hematemesis. Lost 30 pounds in weight.

On admission, July 22, 1902, she was in very poor general condition and cachectic. In the epigastrium was a firm, hard mass that was movable with respiration. The vomitus was not acid. There was no stagnation of food in stomach, as everything ingested had been vomited.

July 23: Posterior gastroenterostomy; Murphy button. The poor general condition of the patient forbade a resection of the pylorus, though the case was a fitting one for that operation. No enlarged glands in omentum or near pylorus. The patient bore the operation nicely. Vomited several times during the first twenty-four hours. The pulse was poor and required stimulation.

July 24: Vomited repeatedly; not checked by lavage. Pulse poor, 108, temperature 102.2°.

July 25: Temperature 103°-103.6°, pulse 122-158. General condition much worse; delirious at times. Vomited repeatedly. Lavage relieved the patient, but did not check the vomiting. No abdominal distension. Wound looked all right. Bowels moved slightly after calomel and salts. Urine contained albumin, hyaline and granular casts.

July 26-27: Did not vomit. High oxgall enema drew off considerable gas. Tongue dry and coated. No abdominal distension. Wound looked well. Temperature 103.2°-101.8°, pulse of poor quality, 116-138.

Death on July 27.

Postmortem.—Lungs: No pneumonia. *Heart:* Some fatty myocarditis. *Liver and Spleen:* Fatty and congested. *Peritoneum: No evidences of peritonitis; intestines normal. Stomach:* Pylorus the seat of small, hard, non-ulcerating carcinoma; pylorie orifice very small, admitting scarcely a small probe. *Gastroenterostomy:* Union

fairly firm; no leakage. Button *in situ;* just commencing to be loosened from stomach wall. Jejunum normal.

1902, vol. i., page 10. *Carcinoma of Stomach; Posterior Gastroenterostomy; Pneumonia; Death.*—Margaret R., 59 years old, had complained for seven weeks of vomiting of food right after its ingestion. No hematemesis. Much loss of flesh and strength.

On admission, November 3, 1902, she was in poor general condition, cachectic; tissues senile; some myocarditis; liver somewhat enlarged; free fluid in abdomen; in epigastrium an indefinite tumor.

Stomach contents faintly acid; no free HCl; total acidity 9; no lactic acid. Microscopical, no Boas-Oppler bacillus.

November 5: Posterior gastroenterostomy; Murphy button. Large tumor involving pylorus and anterior gastric wall.

November 7: Dulness and scattered râles, both bases; bronchovesicular breathing. Vomits several times a day. Temperature 100°-101°. Wound looks well.

November 10: Vomited several ounces of bright blood. Pneumonic signs persist. Temperature 101°, respiration 40.

November 17: Murphy button passed. Pneumonia spread to entire lungs, and patient succumbed November 22, fifteen days after operation.

1902, vol. i., page 16. *Carcinoma of Pylorus; Posterior Gastroenterostomy; Shock; Death.*—Mary S., 46 years of age, admitted April 1, 1902. Complained of gastric symptoms for four and one-half months; these consisted of pain after eating. Pain starts in epigastrium and radiates to shoulder and back. For five days before admission she vomited frequently. Thinks she lost considerable flesh.

Stomach contents: Total acidity 94; free HCl 68, combined HCl 6. Red blood cells and mucus.

Physical examination on admission revealed a well-nourished woman with sound internal organs. Nothing could be palpated in epigastrium; stomach not enlarged.

The vomiting and gastric pain continuing in spite of dietary and medicinal measures, operation was done April 7. Laparotomy. Pyloric tumor occupying posterior aspect of pylorus and head of pancreas; pyloric stenosis; dilated stomach. Gastroenterostomy with Murphy's button. Duration of operation, one hour fifteen minutes. About four hours after operation the patient several times vomited large amounts of dark-brown (hemorrhagic) fluid material. The pulse became very rapid and feeble, and did not respond to stimulation. Death fourteen hours after operation.

Postmortem through the wound.—No leakage at site of button. Anastomosis firm. Large tumor (carcinoma) occupying the posterior wall of the pylorus and head of the pancreas. Metastases in the liver.

Gastrotomy for perforated gastric ulcer with diffuse peritonitis was done once, the patient recovering. The ulcer occupied the anterior wall of the stomach very near the cardiac end. The operation was

undertaken three days after perforation. There was diffuse purulent peritonitis. The patient was a girl, 18 years of age, and had suffered with gastric symptoms for five years. On admission temperature was 104°, pulse rate 120. The perforation could be easily closed by three rows of Lembert sutures. Drainage of site of perforation; no drainage of general peritoneal cavity. Convalescence was interrupted by a prolonged high temperature commencing on the third day after operation and lasting ten days, and due to the presence of a serous exudate in the right subphrenic space. Patient has remained perfectly well up to the present, eighteen months later.

One case of perforation of a large carcinoma of the anterior gastric wall was operated upon:

1902, vol. i., page 13. *Carcinoma of Anterior Wall of Stomach: Perforation; Laparotomy with Closure of Perforation thirteen hours after its occurrence; Death on the sixth day after operation, from Sepsis.*—Jennie H., 42 years old, had suffered with attacks of epigastric pain for several years; this pain was lessened by eating. Three weeks prior to her admission the epigastric pain became very severe and constant; it radiated to the sides and back; it was not relieved by eating. For the last two weeks she vomited all ingesta and a few days before admission she vomited two ounces of bright-red blood. The vomiting occurs immediately after eating. Had lost twelve pounds in weight.

On admission to the medical service, November 18, 1902, there was marked tenderness in the epigastrium and some resistance. An indefinite mass was to be felt three and one-half fingers below the ensiform and to the left of the median line; this mass was smooth, and tender to touch. Temperature and pulse slightly elevated. Diagnosis: Probably old ulcer of stomach, with thickened, indurated edges. Patient was fed exclusively per rectum and an ice bag applied to the epigastrium. On November 19 the vomitus contained some blood. On November 22 the vomiting ceased and patient appeared to be progressing nicely.

November 24: At 10 A.M. had a severe attack of epigastric pain, not radiating. The pain was of sudden onset, was accompanied by nausea but no vomiting. Pain was increased by deep inspiration. Abdominal wall rigid; some distension. At 1 P.M. pain persisted, severe. Abdomen distended and tender, very rigid. Dull note in both flanks; some obliteration of liver flatness. Temperature gradually rising (101.2°), pulse rate rising (from 72 to 120), respiration 24. Leucocytes in morning, 13,000; at 1 P.M., 23,000. Diagnosis: Perforation of stomach. Immediate operation advised.

Consent was withheld until midnight, about thirteen hours after the perforation. At midnight the temperature was 102 + °; pulse 140, poor quality. The other symptoms were much intensified; all evidences of *diffuse peritonitis* developed.

Midnight: Median laparotomy. Free gas escaped on opening peritoneal cavity. Free seropurulent fluid tinged with bile was present in the upper half of peritoneal cavity. The anterior surface of stomach was covered over by the left lobe of the liver. On elevating the latter more gas escaped. The whole of the anterior gastric wall and under surface of the left lobe was covered with purulent fibrin. A perforation the size of a ten-cent piece was seen on the lesser curvature, midway between the pylorus and cardia; from it was exuding bile-stained fluid. The perforation occupied the centre of a large, indurated mass about three inches in diameter and one inch in thickness. It was directly upon the lesser curvature, and the lesser omentum had been separated from the stomach at the site of perforation, thus permitting the retrogastric space to be filled with extravasated material. The stomach was delivered as far as was possible, and the left lobe of the liver elevated. The poor condition of the patient forbade any resection of the indurated mass, which was at first contemplated. Attempts were made to close the perforation by Lembert sutures. All the sutures had to be passed through the indurated mass, and at once tore out. It was impossible to bring the adjoining gastric wall over the tumor mass and thus fold in the entire diseased area. It was suggested to treat the perforation like a gastrostomy opening; but this was not possible, as a Witzel operation could not be performed, and the perforation could not be brought near enough to the abdominal wall to attach it directly. To establish a canal by packings seemed too uncertain. The great omentum was therefore reflected upward over the anterior surface of the stomach, carried across the lesser curvature, and attached by several interrupted sutures to the posterior gastric wall just below the lesser curvature. It was then sewn around the margins of the perforation and indurated area. Toilet of peritoneum. Drainage of site of perforation. Closure of rest of abdominal wound. Time of operation, one hour.

Patient reacted poorly; pulse required active stimulation. For the first seventy-two hours the pulse improved materially in quality and became less rapid, from 180 to 122. On the third day after operation the temperature rose to 105.2° with a chill. There was no vomiting. Nutrition per rectum. Wound inspected and found in good condition. Small quantities of fluid nourishment per os. The deep packings were removed on the fourth day; no evidences of leakage; sutured portion of wound looked well. Pulse more rapid; temperature 103°-104°.

Fifth day: Pulse rapid, 130-148, temperature 104 +°. Leakage from stomach through drainage opening.

Sixth day: Patient failed rapidly, and died.

Postmortem.—Perforation 5 cm. from pylorus close to lesser curvature; opening admits tip of index finger. It lay in centre of large, indurated mass (probably tumor). No peritonitis. The omentum sutured over the perforation was in place, but permitted leakage at the side. Spleen soft and wrinkled; enlarged mesenteric glands. Two healed ulcers near pylorus.

Pathological report of tumor: Carcinoma.

DISEASES OF THE INTESTINES—21 PATIENTS; 9 DEATHS.

	Total.	Cured.	Improved.	Unimproved.	Died.
Acute colitis[1]	1	..	1	..	..
" gangrenous colitis; perforation of cecum.	1	..	..	..	1
Perforated duodenal ulcer; diffuse purulent peritonitis	1	1	..	..	..
Perforation of cecum; perityphlitic abscess, external rupture	1	1	..	..	..
Perforated typhoidal ulcer; diffuse peritonitis...	3	..	..	..	3
Intestinal obstruction due to band	1	1	..	..	..
" " " peritonitis following appendicitis	1	1	..	..	..
Colic stenosis due to adhesions	1	1	..	..	..
Volvulus of sigmoid flexure; pneumonia	1	1	..	..	..
" gangrene of sigmoid and descending colon; peritonitis	1	..	..	..	1
Volvulus of sigmoid flexure[1]	1	..	..	..	1
Diffuse sarcoma of intestines and peritoneum...	1	..	..	..	1
Sarcoma of small intestine	1	1	..	..	..
Carcinoma of splenic flexure of colon	2	..	1	..	1
Malignant growth of hepatic flexure of colon[1]	1	..	..	1	..
Carcinoma of hepatic flexure, intestinal obstruction	1	..	..	..	1
Carcinoma of transverse colon; diabetes[1]	1	..	..	1	..
Diffuse carcinoma of small intestine	1	..	..	1	..
Operations on Intestines—18 Operations on 17 Patients; 8 Deaths.					
Incision and drainage for perforated gangrenous colon	1	..	..	..	1
Suture of duodenal perforation	1	1	..	..	..
" " typhoid perforation of small intestine	3	..	..	..	3
Suture of perforated cecum; appendicectomy	1	1	..	..	..
Division of bands causing intestinal obstruction.	1	1	..	..	..
" " adhesions causing intestinal obstruction; drainage of appendicular abscess; appendicectomy	1	1	..	..	..
Division of adhesions causing stenosis of cecum.	1	1	..	..	..
Reduction of volvulus of sigmoid	1	1	..	..	..
Colostomy and drainage for gangrenous sigmoid due to volvulus	1	..	..	..	1
Exploratory laparotomy for new growth of intestines	2	..	..	1	1
Resection of small intestine (six inches) for sarcoma	1	1	..	..	..
Colostomy for intestinal obstruction due to carcinoma of splenic flexure	1	..	1	..	..
Ileocolostomy for carcinoma of splenic flexure (end-to-side anastomosis[2])	2	..	1	..	1
Ileocolostomy for carcinoma of hepatic flexure; intestinal obstruction; side-to-side anastomosis	1	..	..	..	1

[1]Not operated upon.

[2]One patient was admitted with chronic intestinal obstruction; a preliminary colostomy and subsequent ileocolostomy was performed.

During the past summer in New York City typhoid fever was complicated by an unusual number of perforating ulcers. In Mount Sinai Hospital there were nine cases, three of which were referred to the First Surgical Service for operation. It must be said to the credit of the internal department that in all the cases the diagnosis was made very early and the surgeon's aid called for as soon as consent for operation could be obtained. Thus in two of our cases the operation was performed between eighteen and twenty four hours after perforation; in the third, thirty hours had probably elapsed. Two of the patients were in fairly good condition; the third, though exhausted by a long siege of fever, had nevertheless a regular pulse and of fair quality. These points are mentioned in order to direct attention to the fact that even under the most favorable conditions, as attain in a large hospital service, where early diagnosis and early operative interference can be made, with all the conveniences of hospital operating rooms and trained house staff, a startling mortality will follow the surgeon's efforts at repair of the perforating ulcers. The question must naturally at once arise: Is this mortality to be attributed to the operation, to the perforation *per se*, or to the typhoid fever? As regards the first factor, it certainly is not in most cases a very shocking, or time-consuming, or difficult procedure to find the perforated ulcer; furthermore, typhoid patients bear the operative attack very nicely. It is our experience that even in the later stages of the disease laparotomy is well borne, and the patients rapidly react from the anesthetic. This factor in the mortality can therefore be excluded. As regards the second point that has been raised—viz., does the perforation *per se* result in the death of the patient?—this also can in the majority of cases be considered of secondary importance, for shock attending the perforation is in many instances very slight or even absent altogether. The peritonitis resulting from the perforation varies in extent and virulence in different cases, and, furthermore, bears no constant relation to the length of time the perforation has existed or the extent of the extravasation. As a rule, however, if the cases are operated upon early the infection of peritoneum ought not to be sufficient to cause death.

The third factor to be considered in this connection is the typhoid fever itself. It certainly is well known, and to the internists especially, that typhoid fever is not a constant quantity; that typhoid fever

in New York City is not the same as that in some other centre; that its virulence during one summer is not the same as that during another year. The occurrence of nine cases of perforation during one summer's service, when during other years there were at most one or two cases, points to a greater virulence of the disease during the past year. Further, since we may assume it is usually the severest cases that perforate, we are justified in concluding that of the nine cases some would have succumbed even had no perforation taken place. This varying virulence of the fever will explain the variations in the results following the repair of perforated ulcers during different visitations of the disease. Thus in one season, in which the virulence of the fever is not very intense, the percentage of recovery after the repair of perforated ulcers may much exceed that of another summer in which the fever itself is much more severe. In the statistics heretofore published this varying intensity of the fever during its different visitations has not been considered in estimating the results that follow the surgeon's repair of perforating ulcers; nor has any attempt been made to explain why the same surgeon's mortality rate under similar conditions during one year far exceeds that of the following year. Thus in our own service during the year 1901 one case of typhoid perforation was admitted to the service; the child was admitted with a diffuse peritonitis and the perforation was several days old. Yet, after suture of the ruptured ulcer and cleansing of the peritoneum, the child made a smooth recovery; the typhoid itself gave rise to very few symptoms and seemed to be of a mild type.

As regards the symptoms in our three cases: In none was a preperforative stage observed, neither in the leucocyte count nor in the abdominal symptoms. The first manifestation of the perforation was a severe pain, localized, in two of the cases, to the right lower quadrant of the abdomen, and general in one. Vomiting occurred in one patient. Collapse was not noted in any. The temperature continued high in all. In two the leucocytes gradually increased from the time of perforation, reaching 13,000 and 12,000, respectively; in the third the leucocytes did not go beyond 4,800.

Locally the rigidity of the abdominal muscles was very early in evidence after the perforation had occurred. Obliteration or partial disappearance of liver and splenic dulness was noted in all three cases.

Before operation there was evidence of free fluid in the peritoneal cavity (dulness in both flanks, shifting with change of position).

Diagnosis.—All the typhoid patients in the medical service were very closely and minutely observed. The abdomen was examined at each visit; leucocyte counts were made as a routine procedure twice daily. If the patient complained of abdominal pain, this was at once reported to the house physician, who went immediately to see the patient. The diagnosis of a perforation was made from the following facts: Severe abdominal pain, localized or general; rigidity of the abdominal wall; complete or partial obliteration of liver flatness; increasing leucocytosis. Collapse, fall of temperature, vomiting were not looked upon as essential points in making the diagnosis; they helped, when present, merely to substantiate the other findings.

Operation.—Operation was advised in all cases and performed as soon as consent could be obtained. The advisability of surgical interference in cases in which the perforation and extravasation have taken place into the free peritoneal cavity cannot be questioned; for, if left to their fate, these patients will all of them succumb from septic peritonitis. Where, however, the ulcer before its perforation has formed adhesions to neighboring parts, thus effectually shutting off and protecting the free peritoneal cavity from infection, it is probably wiser to wait before proceeding to operation; for some of these cases will not need operation at all, in others it will only be necessary to drain a localized abscess. It is, from our present data, very difficult to differentiate those cases in which extravasation has taken place into the free peritoneal cavity from those in which it is entirely localized; probably the best point in their differentiation will be the absence of liver dulness in the former and its presence in the latter.

The operation consisted in opening the abdomen in the right iliac fossa, under general anesthesia (gas and ether in two cases, chloroform in one), rapidly finding the perforated ulcer, and closing it with two rows of Lembert sutures. Toilet of the peritoneum, and closure of the abdominal wound with drainage. In one case the peritoneum was completely closed, and likewise the external wound. Death on the fourth day enabled us to make an examination of the wound. The peritoneal cavity was sweet and clean, but the outer wound was the seat of an intense gaseous infection. Thus, while we may dispense

with peritoneal drainage, it is essential to drain the outer fasciæ and muscles.

The histories of these three cases were as follows:

1902, vol. i., page 28. *Typhoid Fever; Admitted to Hospital with Intestinal Perforation of several hours' standing; Laparotomy; Closure of Perforation; Death.*—Charles K., 35 years old, admitted August 29, 1902, in second week of typhoid. Several hours before admission, had abdominal pain, constant in character, but not severe. On examination, abdominal wall lax; tenderness in right iliac fossa; no distension. Spleen enlarged. Liver: No obliteration of flatness. Leucocytes, 8,600; Ehrlich and Widal reactions positive.

August 30: In early morning complained of abdominal pain, at first localized to right lower quadrant, but became general. Abdomen distended. Abdominal wall very rigid. Some free fluid in abdomen. Liver dulness obscured. Temperature 104.6°. Leucocytes, 13,400. Urine acid, 1020, albumin (trace), hyaline and granular casts.

Immediate operation. Median abdominal incision; gas and ether. Escape of free gas and feculent material from peritoneal cavity. Small intestines discolored and covered with patches of fibrin. Perforation in lower coil of ileum. Suture by two rows of Lembert. Drainage of peritoneal cavity. Partial closure of abdominal wound. Patient did not react well; pulse failed in spite of stimulation. Death after fifteen hours. No autopsy.

1902, vol. i., page 26. *Typhoid Fever; Relapse; Perforation during the Relapse; Large Localized Abscess in Sacral Concavity; Incision and Drainage of Abscess; Intestinal Fistula; Death.*—Pauline M., 42 years old, tailoress, admitted August 31, 1902, in the third week of a very severe typhoid fever. Passed through five weeks of fever; by September 26 temperature reached the normal. Then commenced a relapse complicated by pneumonia at right base. Pneumonia cleared up by seventh day.

October 6: Patient complained of abdominal pain, not very severe; no collapse. Abdomen rigid; exquisite tenderness in left side of hypogastrium, corresponding to which is an area of dulness. Liver dulness almost entirely obliterated. Leucocytes, 12,000. Temperature 102.6°, pulse 108.

Immediate operation. Median laparotomy under gas and ether. Omentum adherent to abscess in pelvis. Small abscess in omentum. Large abscess in sacral concavity, well walled off from general peritoneal cavity, and containing malodorous pus. Evacuation and drainage of this abscess cavity. Partial closure of abdominal wound.

Patient reacted well. Temperature remained between 103° and 104°; pulse regular, between 120 and 140. Vomited several times

during first day. For the next three days temperature between 103° and 104°, pulse poor and rapid. Vomited repeatedly. An enema was partly expelled into the abdominal wound through the perforated ulcer. On the fifth day patient succumbed to peritonitis.

Postmortem.—Peritonitis in lower part of abdomen, with sacculations of pus and feces. In ileum, about 25 cm. from ileocecal valve, a perforated ulcer, the opening in which is one-third cm. in diameter, and partly closed by adherent omentum.

Comments.—In this case it might have been advisable to wait until the abscess was better sacculated and then to have incised it per rectum.

1902, vol. i., page 27. *Typhoid Fever; Perforation; Diffuse Peritonitis; Laparotomy with Closure of Perforation; Death.*—Fanny O., housewife, 42 years old, admitted October 5, 1902, in the second week of severe typhoid fever. During the week of her stay in the medical service her temperatures were very high, 106°.

October 5: At 6:30 A.M. severe abdominal pain and chilly sensations. Abdomen tender but lax. At 10 A.M. temperature rose to 106°, pulse 128; vomited once; abdomen lax; liver dulness not obliterated. Leucocytes, 3,500. At 5 P.M. no change in symptoms. At 10 P.M. pain in lower right side of abdomen. Slight dulness in right iliac fossa; over this area there is tenderness. Abdominal wall lax. Liver dulness partially obliterated. Leucocytes, 4,800. Vomited nourishment.

Operation 2 A.M. Laparotomy through right rectus muscle under chloroform. Free gas and free feculent material in peritoneal cavity. Perforated ulcer in lower coil of ileum. Closure by two rows of mattress Lembert silk sutures. Toilet of peritoneum. Closure of peritoneum and outer wound without drainage.

Patient reacted well. Temperature and pulse continued high. Some nephritis developed. Bowels moved on the third day. General condition remained good until morning of fourth day, when patient suddenly collapsed and died a few hours later.

Postmortem.—Peritoneum sweet and clean; no leakage from perforation. Outer abdominal wound the seat of severe gaseous infection.

Comments.—The severe infection of the outer wound would indicate that though the peritoneal cavity may be closed without drainage, the outer fasciæ and muscles must be provided with sufficient gauze or tube drainage.

The histories of the other fatal cases were:

1902, vol. i., page 44. *Gangrenous Colitis; Perforation of Colon; Localized Abscess; Incision and Drainage; Death.*—Bella Y., 50 years

old, admitted to the medical service on August 22, 1902. Her illness was of two weeks' duration. It began with very frequent diarrheal movements. She had pain in upper part of abdomen. No chill or fever or vomiting. Only twice was a little blood in the stools.

On admission she was very apathetic; temperature 102.4°, pulse 130 and regular. Liver enlarged three fingers below free border of ribs. In lower right quadrant of abdomen was a tender mass, smooth and hard, fixed to the posterior parietes, and dull to percussion. Leucocytes, 12,000. Urine acid, 1018; trace of albumin; bile and indican present; no sugar; pus cells, red cells, and hyaline casts. Ehrlich reaction positive.

The pulse under free stimulation improved in quality, and on August 23 she was transferred to the surgical side for operation. Laparotomy under gas and ether anesthesia. Longitudinal incision over the mass. Exposure of the tumor showed it to contain feces and what appeared to be gangrenous mucosa of the intestine. Evacuation and drainage of cavity. Dry dressing. On August 24-25, fecal discharge through dressings. Gradual failure of pulse. Death on August 26.

Wound examination.—The entire hepatic flexure adherent to neighboring viscera and parietes, and gangrenous. The rest of the colon showed gangrenous and ulcerating patches in the mucosa. The mucosa of the hepatic flexure absent (probably represented the gangrenous material found at operation). Gall bladder enlarged; contained pus and calculi; adherent to colon and liver. Kidneys, marked degeneration.

1902, vol. i., page 41. *Acute Volvulus; Gangrene of Sigmoid Flexure; Laparotomy; Tube Drainage and Exclusion of Gangrenous Intestine from the Peritoneal Cavity; Death.*—Mendel B., 73 years old, merchant, admitted to medical service March 10, 1902. Symptoms were of four days' standing. During this period there was no movement of the bowels; no fever, chills; no pain; no spontaneous vomiting, abdominal distension; no prostration. Urine acid, 1036; trace of albumin; many casts, few red cells. Temperature 99°, pulse 80. Abdomen distended; free fluid in the flanks; tumefaction in lower half of abdomen; no marked tenderness or pain.

Attempts to move the bowels by castor oil and high oxgall enema ineffectual. Transferred to the surgical side. Immediate laparotomy. Left lateral incision. Considerable malodorous, brownish fluid in peritoneal cavity. Sigmoid flexure gangrenous. The poor condition of the patient forbade any prolonged procedure. Drainage and exclusion of gangrenous intestine from the general peritoneal cavity by gauze tamponade. Dressing. Death in collapse a few hours later.

Wound examination.—Sigmoid flexure gangrenous, twisted around its axis; diffuse peritonitis.

A second case of volvulus was admitted in moribund condition. Operation was not deemed advisable. Death within twelve hours. Postmortem showed the descending colon to be twice twisted around its longitudinal axis, completely gangrenous.

1902, vol. i., page 45. *Diffuse Sarcoma of Intestines and Peritoneum; Exploratory Laparotomy; Death five weeks later from Cachexia.*—Abraham G., 29 years old, admitted November 24, 1901. Had been operated upon for appendicitis five years before. No syphilitic history. His present trouble was of seven months' duration; onset with malaise, night sweats, repeated vomiting of food, and nausea. Pain in epigastrium commenced two months later; it was worse after vomiting. Jaundiced once, five months before admission, this lasting two months. At first his bowels were constipated; latterly they had become very loose, stools very black in color. No coffee-ground vomitus.

On admission, dulness and bronchovesicular breathing over right apex. Liver enlarged one inch below costal margin. Spleen somewhat enlarged. No palpable tumor in abdomen. Enlarged glands in neck and groin.

November 26: Exploratory laparotomy. Clear serous fluid in peritoneal cavity. On convexity of liver several grayish-white nodules, bleeding on slightest touch, varying from 3 mm. to 1½ inches in diameter. Peritoneal surface of pylorus studded with similar nodules. Retroperitoneal glands enlarged and hard. Omentum contained a number of nodules, some having undergone cheesy degeneration; a few were removed for examination. Intestinal loops adherent and studded in places with small nodular masses. Layer suture of abdominal wall, with drainage.

December 3: Protrusion of omentum and some loops of intestines through the wound, which had burst open.

December 17: Fecal fistula formed. Wound had very unhealthy appearance.

Gradual emaciation and advancing cachexia and asthenia. Death December 26.

1902, vol. i., page 38. *Carcinoma of Splenic Flexure; Intestinal Obstruction; Artificial Anus in the Right Iliac Region; Ileocolostomy after Recovery from the first Operation; Death on the tenth day from Perforation of the Small Intestine at site of Anastomosis, due to Pressure Necrosis from the Murphy Button.*—Hannah H., 73 years old, still a fairly vigorous woman, suffered from intestinal obstruction, for relief of which an artificial anus in the cecum had been made. Six weeks after her recovery from this operation, at the urgent request of the patient to rid her of the disagreeable feature of the artificial anus.

an ileocolostomy was done, end-to-side anastomosis, using the Murphy button. The patient made an excellent recovery from the operation. She was up and about, and was to be discharged, when she suddenly collapsed on the tenth day and died within six hours.

Postmortem.—No air or feces in peritoneal cavity. Considerable fresh fibrin at site of anastomosis. Small intestine at site of anastomosis showed marginal necrosis, permitting the button to show through. Large, hard mass in splenic region, involving spleen, left kidney, and splenic flexure, and kinking the latter. Kidneys, chronic interstitial nephritis. Liver fatty and congested.

Comments.—In this case death was due to necrosis of the small intestine at the site of the anastomosis, from pressure of the button. Whether we are to consider that this pressure necrosis was indirectly owing to the old age of the patient (73) or to her chronic nephritis is a question; but the experience gained in this case will dispose us to make use of the suture instead of the button in future cases of anastomosis in nephritic or very aged subjects.

1902, vol. i., page 36. *Carcinoma of Hepatic Flexure of Colon; Intestinal Obstruction; Side-to-side Anastomosis; Nephritis; Death.*—Hilda L., 60 years old, had suffered from constipation for two years. Acute obstructive symptoms commenced five days before her admission. On admission, December 8, 1901, she was in poor condition; pulse irregular; abdomen not much distended. In right iliac region, about the level of the umbilicus, was a doughy mass the size of an orange, not tender. Urine acid, 1012; trace of albumin; granular casts.

Immediate celiotomy. Some clear serous fluid in abdomen. Small intestines moderately distended and injected. Hard tumor at hepatic flexure. Side-to-side anastomosis between small intestines and descending colon. Closure of abdomen. Patient reacted poorly. Passed no urine after operation. Succumbed twenty-four hours after operation from cardiac failure.

Comments.—In this case an anastomosis was decided upon because the intestines were not much distended; secondly, it would not consume any more time than a colostomy, and the patient would be spared the disagreeable accompaniments of an artificial anus in the cecal region (and especially as the stools are usually fluid when a colostomy is performed at this place).

The case of duodenal perforation will be reported in a special article by Dr. Berg.

DISEASES OF APPENDIX VERMIFORMIS[1]—101 CASES: 10 DEATHS.

	Total	Cured	Improved	Deaths
(A) Appendix not perforated.				
Acute catarrhal appendicitis[2]	11	9	2	..
Subacute " "	3	2	1	..
Chronic " "	18	15	3	..
Acute ulcerative appendicitis	3	3	..	..
" " " with marked symptoms of septicemia	2	1	..	1
Acute empyema of appendix[4]	4	4	..	..
" " " " with gangrene[5]	3	2	..	1
Acute gangrenous non-perforative appendicitis	10	10	..	..
" " " " " with periappendicular abscess	1	1	..	..
Acute gangrenous non-perforative appendicitis with free exudate in peritoneal cavity	3	3	..	..
Acute gangrenous non-perforative appendicitis; thrombosis of mesenteriolum	1	1	..	..
Carcinoma of appendix	1	1	..	..
(B) Appendix perforated; local or complete gangrene.				
(a) Circumscribed peritonitis; abscess:				
(1) No free exudate in peritoneal cavity	21	21	..	..
" " " " " multiple omental abscesses	1	1	..	..
No free exudate in peritoneal cavity; secondary subphrenic abscess	1	1	..	..
(2) Free exudate in peritoneal cavity	4	4	..	..
" " " " " purulent thrombosis of mesenteriolum	1	1	..	..
(b) Diffuse purulent peritonitis[6]	13	5	..	8

Operations—95 Operations on 91 Patients; 9 Deaths.

	Total.	Cured	Deaths
Appendicectomy for acute catarrhal appendicitis[7]	11	11	..
" " chronic "	15	15	..
" " acute ulcerative "	5	4	1

[1]Appendix removed in a number of other patients in whom the abdomen was opened for diseases other than that of appendix vermiformis. These are not included in the tabulation.

[2]One case with acute ulcerative endocarditis.

[3]These cases refused operation in the quiescent period.

[4]One case had also chronic salpingo-oöphoritis.

[5]One case was complicated post-operatively with gangrene of six inches of ileum, and resulted fatally.

[6]One case not operated; admitted moribund.

[7]In one case, in which the Kammerer incision had been employed, this was followed on the tenth day (post operationem) by a ventral omental hernia that was irreducible; this was owing to a violent straining effort on the patient's part. A laparotomy for the cure of the hernia, undertaken some weeks later, was followed by death of the patient. (See ventral hernia.)

	Total.	Cured.	Deaths.
Appendicectomy for acute empyema of appendix[8]	7	6	1[9]
" " acute gangrenous, non-perforating appendicitis	13	13	..
Appendicectomy for acute gangrenous, non-perforating appendicitis; evacuation and drainage of periappendicular abscess	1	1	..
Appendicectomy for acute gangrenous, non-perforating appendicitis; incision of thrombosis of mesenteriolum	1	1	..
Appendicectomy for carcinoma of appendix	1	1	..
For circumscribed peritonitis; abscess[10]:			
Evacuation of abscess; drainage; no appendicectomy	1	1	..
" " " " appendicectomy[11]	26	26	..
" " " " " secondary drainage of subphrenic abscess; costal route	1	1	..
Evacuation of abscess; drainage; appendicectomy; incision of purulent thrombosis of mesenteriolum	1	1	..
For diffuse peritonitis:			
Evacuation of abscess; drainage; drainage of peritoneal cavity	3	1	2
Evacuation of abscess; drainage; irrigation and drainage of peritoneal cavity	2	1	1
Evacuation of abscess; drainage; no drainage of peritoneal cavity	7	3	4
Evacuation of abscess; drainage; drainage of subphrenic abscess; drainage by costal route	1	..	1

We had occasion in our last report to call attention to the importance of the vascular and blood lesions that accompany acute inflammations of the appendix vermiformis. As there pointed out, these lesions bear no relation to the severity of the local changes—a fact that is well illustrated by one of the fatal cases of the past year.

1902, vol. i., page 138. *Acute Appendicitis; Fondroyant Septicemia; Appendicectomy; Death eighteen hours later.*—Lena T., a servant-girl, single, 22 years of age, had never been sick until five days before admission. Her present illness commenced with chilly sensations and headache; three days later she had severe pain in the right iliac region, radiating down the legs. The day before admission she vomited repeatedly a watery fluid material. Bowels moved daily.

On admission, February 4, 1902, she was in a poorly nourished condition and very much prostrated. The heart and lungs were normal. There was marked tenderness in the right iliac region; the right rectus was exquisitely tender; no definite mass was to be felt; some abdominal distension. Rectally a tender area was to be felt high up and to the

[8]One case combined with right salpingo-oöphorectomy.
[9]Death due to post-operative gangrene of six inches of ileum.
[10]Two cases followed by fecal fistula.
[11]Median laparotomy was practised in two cases in which the abscess was in the middle line in the sacral concavity.

right. Genital organs normal. Temperature 104°, pulse 114. Diagnosis: Acute appendicitis.

Immediate laparotomy for removal of the appendix. Appendix located below and to the outer side of the caput, embedded in thin lymph. It was developed, deligated, and removed. It was 2½ inches long, its peritoneal coat injected, and its mucosa showed a few minute hemorrhagic areas. The cecum and part of the omentum were very much injected.

The patient reacted poorly. The pulse, in spite of vigorous stimulation, gradually failed, the temperature rose to 105.4°, vomiting was incessant, and death occurred eighteen hours later, the clinical picture being that of a foudroyant septicemia. No autopsy permitted.

It has been our experience that in these cases the general symptoms of poisoning are far more in evidence than the local manifestations from the diseased appendix. As a rule a severe chill ushers in the attack; the pulse rate rises rapidly, the *temperature varying, being either slightly or considerably elevated. The patients look sick and are very much prostrated.* With the history of such an onset, irrespective of the intensity of the local abdominal symptoms, we resort to *immediate operative interference.*

In the last volume of our reports two fatal cases of septicopyemia, with purulent thrombosis of the mesenteric and portal veins and purulent infarctions in the liver, were reported. During the year 1901 several more cases were encountered, all of which ended fatally. In 1902 we had two cases of purulent thrombosis of the vessels of the appendicular mesentery and of the cecum. Both these cases recovered after removal of the appendix with its mesentery and drainage of the thrombosed veins. Their histories were:

1902, vol. i., page 158. *Acute Gangrenous Appendicitis; Thrombosis of Mesenteriolum of Appendix and Adjoining Veins of Cecum; Appendicectomy; Drainage of Thrombosed Veins; Cured.*—J. G., 24 years old, a canvasser, was never sick until thirty-six hours before his admission. During the first twelve hours he felt chilly at intervals and suffered with pains in the right iliac fossa. During the last twenty-four hours he had two severe chills and vomited repeatedly, the pain in the right iliac region remaining constant.

On admission, April 26, 1902, temperature was 102.4°, pulse 108. He was well nourished. His internal organs were normal. The lower half of the right rectus was slightly rigid. Exquisite tenderness from McBurney's point downward and inward to the pubes; no distinct mass was to be felt. Rectally nothing except distended intestines could be palpated. Diagnosis: Acute appendicitis; probably venous thrombosis.

Immediate laparotomy was proceeded with. Just before taking the anesthetic the patient had a very severe rigor. The appendix was located anteriorly to the caput coli, lying free and surrounded by omentum. It was 2½ inches long, dusky in color, and completely gangrenous. The vessels of the mesenteriolum contained purulent thrombi. The vessels of the caput coli could be palpated as rigid cords. This rigidity extended well up along the ascending colon. The appendix was delivered from its omental bed, its mesenteriolum deligated at as high a point as possible, and the appendix, after ligating its base, removed. In the stump of the mesenteriolum could be seen the purulent thrombi in the veins. The veins in the stump and in the adjoining portion of the cecum were drained by gauze, and the wound closed.

The patient reacted well. The temperature fell during the next twenty-four hours to 99°, the pulse rate to 72; with chilly sensations it rose suddenly in the next four hours to 103°, pulse rate 92; it then declined rapidly to 97.8° on the third day, and thereafter fluctuated between 99° and 100°. There was a profuse purulent discharge from the drain opening for ten days; thereafter the wound healed rapidly

1902, vol. i., page 179. *Perforated Empyema of Appendix; Purulent Thrombosis of Vessels of Appendix and Neighboring Cecum; Appendicectomy; Removal of Mesenteriolum; Incision and Drainage of Thrombosed Veins; Cured.*—Isaac M., 27 years old, a presser, had never been ill until the present time. Thirty-six hours before admission he began to suffer with severe abdominal cramps; vomited repeatedly; was chilly at onset. During his transportation to the hospital the abdominal pains subsided very materially.

On admission, December 19, 1901, he was in fair general condition, but looked very sick; his temperature was 104°, pulse rate 82. The internal organs were normal. The abdomen was rigid and tender all over, but especially so in the right iliac fossa; free fluid in both flanks. Rectally a tender area high up could be palpated. Diagnosis: Acute appendicitis; peritonitis.

Immediate laparotomy. Free exudate in the peritoneal cavity. There was a localized encapsulated exudate in the right iliac fossa below and external to the caput coli. This was very thick and tenacious, but odorless. The appendix was found internal and below the caput coli, curled up in a semicircle. It was perforated, and from the hole brownish pus exuded. The mesenteriolum was infiltrated with pus, and the purulent infiltration extended up to the adjoining vessels of the cecum. The appendix with its mesenteriolum was deligated and removed. The purulent veins of the caput were incised and curetted and drained. During this part of the manipulation the cecum was punctured, and at once closed by Lembert suture. Drainage of stump of mesentery and appendix and cecal region; closure of rest of the wound. The temperature fell after operation to 100.8° and then rose

to 102.2°, and continued for the next ten days between 100° and 101°. There was a profuse purulent discharge from the drainage opening for a week; thereafter rapid closure of the wound. The convalescence was interrupted by a rather severe attack of tonsillitis. Discharged cured February 2, 1902.

It is an interesting question how we shall explain the course and final disposition of the infectious thrombi in these two cases. Are we to consider that the thrombosis remained localized in the veins which were found to be involved at the operation; that these thrombi eventually broke down into fluid pus and were discharged through the drain opening; or are we to believe that some of the infectious material did pass up into the mesenteric and portal vessels and liver and was finally destroyed by the liver cells? In the first of the two cases we have reason to assume, on account of the chill thirty-six hours after operation, with a sudden rise of temperature and a rapid decline to a subnormal point, that some infectious material did escape into the portal system and was probably destroyed in the liver. In the last case the absence of a chill and high fever subsequent to operation would lead us to infer that the thrombosis remained entirely localized and that the purulent thrombi broke down and were discharged in the secretions from the wound. That the liver is able to cope successfully with a limited amount of infectious material is well known,[1] and probably explains why septic infarction of its substance from infections in the portal system of veins is not always attended with the formation of abscesses in it.

In the past year there were admitted 13 cases of diffuse purulent peritonitis secondary to appendicitis. Of these, one was in a moribund condition and was not operated upon. In all but one of the operated cases the appendix was removed and an abscess cavity, when it existed, was thoroughly drained. In 3 the peritonitis itself was treated by gauze drainage; two died and one recovered. In 7 no peritoneal drainage was employed, the peritoneal cavity being mopped dry of the exudate and the wound closed as far as the exit of the drain passing into the abscess cavity; 4 died and 3 recovered. In 2 the peritoneal cavity was cleansed by irrigation with hot normal saline solution, and then drained with gauze; death followed in one, shortly after the operation, from shock; the other was cured.

[1]Johns Hopkins Hospital Reports, vol. viii., Nos. 3-9.

The question of peritoneal drainage in cases of purulent peritonitis is a most important one, and has engaged our attention for several years past. In 1899 and 1900, with the consent of Dr. Gerster, Dr. Berg treated 6 cases of diffuse purulent peritonitis without drainage; since then 8 other cases have been so handled. Of the 14 cases, 8 recovered and 6 died—a mortality of 44 per cent. During the same period 24 cases were treated by extensive peritoneal drainage with gauze and tubes; of these, 8 recovered and 16 died—a mortality of 66 per cent. In 3 other cases the peritoneal cavity was cleansed by irrigation with hot normal saline solution and then drained; 2 died and 1 recovered, or 66 per cent. mortality.

Only those cases were treated without peritoneal drainage in which at the time of operation the peritoneum was smooth and uncovered by granulations; otherwise the cases were not selected, and some of them were indeed suffering with intensely virulent and extensive infections of the peritoneum. (For a full discussion of this question and technique of operation see articles by Dr. Berg in Mount Sinai Reports, 1900, and *Medical Record*, June 30, 1900.) Dr. Berg will shortly publish these 14 cases *in extenso*.

The fatal cases of the past year were as follows:

1902, vol. i., page 134. *Acute Appendicitis; Diffuse Peritonitis; Admitted Moribund; Died without Operation; No Postmortem Permitted.*

1902, vol. i., page 161. *Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Appendicectomy; Counter-incision; Peritoneal Irrigation; Drainage; Death.*—Samuel S., 7 years old, taken sick two days before admission with pain in right side; felt sick; vomited; no chills.

On admission, February 7, 1902, temperature 103.6°, pulse rate 128. Examination revealed healthy internal organs; abdomen rigid and slightly distended; right iliac fossa especially tender; no mass to be felt. Immediate laparotomy. Appendix gangrenous; diffuse purulent peritonitis; appendicectomy; irrigation of peritoneal cavity; drainage; counter-incision in left iliac region for drainage. Death a few hours later from shock.

1902, vol. i., page 130. *Acute Appendicitis; Diffuse Sacculated Purulent Peritonitis; Drainage of a Number of the Sacculations; Death from Septicemia.*—Frank S., 22 years old, never had a previous

attack of appendicitis. Four days before admission, began to have general abdominal pain, which became localized to right iliac fossa. Two days later had a severe chill.

On admission, April 16, 1902, temperature was 104.2°, pulse 120. Abdomen was everywhere tender and distended; large mass could be felt in right iliac fossa.

Immediate laparotomy. A number of large cavities containing very fetid, foul pus were evacuated and drained. Appendix could not be readily located. Continuance of high fever and inability to secure a movement of the bowels prompted a revision on the following day. An acute kink of the small intestine from adhesion to a gauze drain was found as the cause of the obstruction. Two other large abscesses between the intestinal coils evacuated. Omentum gangrenous in patches. Drainage. Several hours after this revision, bowels moved freely, but the severe intoxication continued, and death occurred April 21, 1902.

1902, vol. i., page 162. *Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Appendicectomy; Peritoneal Drainage; Death.*—Edna W., 3 years old, commenced to complain, four and one-half days before admission, of abdominal cramps and diarrhea. The next day the child collapsed; temperature was 102°; abdomen became tense; vomited, and bowels did not move. The child became progressively worse until her admission, July 25, 1902. At that time the temperature was 102°, pulse 144; Hippocratic facies; abdomen rigid and distended, markedly tender, and especially so in the right iliac fossa; shifting dulness in both flanks.

Immediate laparotomy. Appendix gangrenous, perforated at apex; peritoneal cavity filled with foul, thick pus and fibrin. Appendicectomy; gauze drainage. Death from shock six hours later. No autopsy.

1902, vol. i., page 165. *Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Appendicectomy; Peritoneal Drainage; Death.*—Bertha K., 13 years old, never had a previous attack of appendicitis. The present attack was of five days' duration. No initial chill, but two days after the onset had a severe chill, from which time the peritonitis dates.

On admission temperature was 101°, pulse 135; abdomen rigid, very tense, much distended; shifting dulness in both flanks; no mass to be felt on account of extreme rigidity of the abdominal muscles.

Immediate laparotomy. Appendix gangrenous and perforated; diffuse fibrino-purulent peritonitis; omentum necrotic in patches and its vessels thrombosed. Appendicectomy; peritoneal drainage; injection of 20 gm. of concentrated (50 per cent.) magnesium sulphate into the

small intestine. Died twenty-four hours later of septicemia, temperature rising to 107.8°.

1902, vol. i., page 163. *Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Chronic Nephritis; Appendicectomy; No Peritoneal Drainage; Death.*—Aaron W., 45 years old, had repeated attacks of intestinal colic. The present illness was of thirty-six hours' duration, marked by intense pain in abdomen and right iliac fossa, vomiting, hiccoughing, and inability to move the bowels; considerable fever. Urine, albumin and casts.

On admission, August 16, temperature was 100.4°, pulse 108. Abdomen was much distended and rigid; dulness in both flanks; marked tenderness in right iliac fossa; Hippocratic facies.

Immediate laparotomy. Appendix gangrenous and perforated; localized abscess; diffuse purulent peritonitis. Appendicectomy; drying out of peritoneal exudate; no peritoneal drainage; drainage of abscess. Did well for forty-eight hours, then ceased to pass urine, and succumbed on the third day from septicemia.

1902, vol. i., page 164. *Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Extensive Collection of Pus in Right Subphrenic Space; Appendicectomy; Drainage; Death.*—Simon W., 15 years of age. First attack of appendicitis; four days' duration; peritonitis of two days' duration.

On admission, May 14, 1902, temperature 104.2°, pulse 150. Base of right lung compressed, and signs of fluid beneath the diaphragm; abdomen distended and rigid, very tender; palpation difficult on account of rigidity; no mass to be felt per rectum. A mitral stenosis and insufficiency present. Aspiration of right subphrenic space yielded foul pus. Transpleural incision and drainage of large collection of purulent material above and behind the liver. Exploration showed entire peritoneal cavity to contain pus. Incision over appendix; latter organ found retrocolic, gangrenous, and perforated; diffuse purulent peritonitis. Appendicectomy; drying of peritoneal cavity. Death twelve hours later.

It is to be especially noted that the technique of closure of that portion of the incision which is not needed for drainage has been changed. We formerly used through-and-through silk or silkworm-gut sutures, and only too often did serious and extensive phlegmons of the abdominal wall result from infection of the stitch canals. We now sew the peritoneum with catgut, and the fascia or muscles with chromic gut, strapping the skin with sterile zinc-oxide straps. The infections have almost entirely ceased, the wounds healing kindly by first intention.

DISEASES OF THE LIVER—12 CASES; 4 DEATHS.

	Total	Cured	Improved	Unimproved	Died.
Acute degeneration of the liver (during pregnancy)[1]	1	..	..	..	1
Liver abscess, traumatic	1	1	..	..	..
" " single, secondary to colitis	5	5	..	..	..
" " amebic; amebic colitis	3	..	..	..	3
Carcinoma of liver secondary to cholelithiasis[1]	1	..	..	1	..
Periendothelioma of liver	1	..	..	1	..
Operations upon Liver—11 Operations on 10 Patients; 3 Deaths.					
Exploratory laparotomy for new growth	1	..	..	1	..
Laparotomy for liver abscess	1	1	..	..	..
Transpleural route for drainage of liver abscess	6	5	..	..	1
Subpleural " " " " " "	1	..	..	..	1
Combined transpleural and transperitoneal operations for drainage of liver abscess	1	..	..	..	1
Colostomy for amebic colitis with liver abscess	1	..	..	..	..

The cases of liver abscess occurring in the First Surgical Division of Mount Sinai Hospital during the past three years, and those of the entire surgical service during 1898-1899, will be made the subject of a special article by Dr. Berg, and will appear shortly.

The fatal cases during the past year were all amebic abscesses of the liver secondary to amebic colitis. Their histories were:

1902, vol. ii., page 290. *Amebic Abscess of the Liver Secondary to Amebic Colitis; Subpleural Hepatotomy and Drainage; Died.*—Ida H., 52 years old, suffered with diarrhea for the past year. During the past four weeks she had almost constant pain in right side of abdomen, not radiating; chills and fever; night sweats; no jaundice.

On admission, September 9, 1902, liver was enlarged upward and backward to angle of scapula and downward to one finger's breadth below umbilicus. Marked tenderness over liver; crepitant râles over its convexity. Temperature 99°-104.4°, pulse 100; leucocytes, 13,000. Urine acid; trace of bile. Stools clay-colored. Aspiration of liver yielded pus.

September 10: Subpleural hepatotomy; evacuation and drainage of large liver abscess. Resection of tenth rib in post-axillary region. Reflection of pleura raised up from diaphragm and parietes. Incision of diaphragm. Hepatotomy. Evacuation of large amount of pus. Tube drainage.

September 11: Profuse discharge of pus from abscess cavity containing amebæ. No evidences of pleural involvement. General condition good.

[1]Not operated.

September 16: The wound pale and necrotic; no evidences of granulation. Almost continuous diarrhea, stools containing amebæ. Temperature between 100° and 102°.

September 18: Death from exhaustion. Diarrhea almost continuously. No autopsy.

1902, vol. ii., page 292. *Amebic Abscess of Liver; Amebic Colitis; Transpleural Hepatotomy and Drainage of Abscess; Colostomy to Exclude the Large Intestine; Death.*—Solomon B., 17 years old. His previous history was not obtainable. Had just arrived in this country from Roumania. For five days before admission, October 14, 1902, he had chilly sensations; fever; no diarrhea; movements dark; no blood, no jaundice.

On entrance to hospital temperature was 105.2°, pulse 100, small and feeble; no jaundice; liver enlarged downward; tenderness in axillary region over liver, friction sounds over convexity of liver. Aspiration of liver yielded thick pus.

Immediate operation. Transpleural hepatotomy; evacuation of large liver abscess; drainage. Abscess wall necrotic.

October 16: Abscess cavity discharges moderately; amebæ in the pus. Profuse diarrhea commenced, stools containing mucus and blood; amebæ in stools.

October 19: Diarrhea continued profuse; patient exhausted by continued stools. Temperatures between 101° and 103°.

October 20: Colostomy under eucaine for exclusion of large intestine from fecal current.

October 21: Large hemorrhage from descending colon.

October 22: Colon irrigated through colostomy wound. Three hemorrhages from colon, and patient died shortly after the last one.

Autopsy through the wound.—Entire colon, upper part of rectum, and last ten inches of ileum studded with various sized ulcers; edges of these undermined; bases deep. The abscess in the liver had a necrotic, ragged, honeycombed wall. Kidney, acute degeneration. It was impossible to find the vessel that gave rise to hemorrhage.

1902, vol. ii., page 293. *Amebic Abscess of Liver; Amebic Colitis; Laparotomy, Drainage, and Transpleural Counter-drainage; Death.*—Abraham G., 55 years old, admitted May 9. Suffered for some time prior to present illness with diarrhea. For six months he had severe, sharp pains in right side of chest and abdomen, radiating to back, and right shoulder; pain worse on coughing; no jaundice; frequent chills and night sweats. Lost 48 pounds in this time.

On admission his general condition was poor; no jaundice; temperature 101.6°; liver enlarged downward one finger's breadth below free border of ribs; tenderness over liver; râles over its convexity. Connected with lower edge of liver a large mass reaching to level of umbilicus. Aspiration anteriorly yielded pus.

Immediate operation. Laparotomy; hepatotomy; peritoneal cavity protected by gauze packings; evacuation and drainage of large abscess

in right lobe, which reached well back to the posterior surface of the liver. To secure better drainage, a counter-incision was made behind, the pleural cavity shut off by sutures, the diaphragm and liver incised, and through-and-through drainage established. Temperatures declined after operation to 98° to 100°; at end of the first week they fluctuated between 100° and 102°, though drainage of the abscess cavity was excellent. Profuse and almost continuous diarrheal movements commenced at end of first week, and continued in spite of every kind of medication and local treatment. Amebæ in stools and in pus from liver. The abscess cavity in the liver showed no tendency to contract; its walls remained necrotic and discharged a profuse secretion mixed with bile. Quinine internally, and irrigations of the abscess cavity and colon with solution of quinine 3 per cent., had no influence upon the disease process. The diarrhea continued, and gradually the patient's strength became exhausted. Death July 7, 1902. No autopsy.

DISEASES OF THE GALL BLADDER AND BILE DUCTS—21 PATIENTS; 5 DEATHS.

	Total	Cured	Improved	Unimproved	Died
Cholelithiasis[1]	2	..	..	2	..
" biliary colic; jaundice[1]	1	..	1	..	..
" peripyloritis and gastritis[1]	1	..	1	..	..
" empyema of gall bladder[1]	1	..	..	1	..
" subacute cholecystitis; calculi in gall bladder	1	1	..	..	..
Cholelithiasis; contracted gall bladder; pyloric stenosis	1	1	..	..	..
Cholelithiasis; acute cholecystitis; calculi in gall bladder	4	3	1	..	..
Cholelithiasis; empyema of gall bladder; calculi in gall bladder	1	1	..	..	..
Cholelithiasis; empyema of gall bladder; calculi in gall bladder; myocarditis	1	..	..	..	1
Cholelithiasis; empyema of gall bladder; calculi in gall bladder and cystic duct	1	1	..	..	..
Cholelithiasis; gangrenous cholecystitis; stones in gall bladder and cysticus	1	..	..	..	1
Cholelithiasis; gangrenous cholecystitis; cholemia; calculi in gall bladder	1	..	..	..	1
Cholelithiasis; calculus in choledochus; ruptured empyema of gall bladder[2]	1	1	..	..	..
Cholelithiasis; calculus in choledochus; contracted gall bladder containing calculi; jaundice[3]	4	2	..	..	2

[1]Not operated upon.

[2]Had been operated upon at a previous time for acute empyema of gall bladder with cholelithiasis, and discharged with a sinus.

[3]One of these patients had been operated upon at a previous time for empyema of gall bladder and cholelithiasis. The common duct was not opened at primary operation, on account of the poor condition of the patient; a secondary operation was deemed more advisable.

Operations upon Gall Bladder and Bile Ducts—21 Operations on 16 Patients.

	Total.	Cured.	Improved.	Died.
Drainage of gall bladder for ruptured empyema	1[4]	..	..	..
Cholecystostomy and drainage	6	2	1[5]	3
Cholecystectomy	3	3	..	..
" extirpation of mucosa of gall bladder (Mayo's operation)	1	1	..	..
Cholecystectomy and pyloroplasty (Heineke-Mikulicz)	1	1	..	..
Cysticotomy and drainage	1	1[6]	..	..
Choledochotomy and drainage	1[4]	1	..	..
" " cholecystostomy; drainage	2	..	..	2
" " extirpation of mucosa of gall bladder[7]	2	2	..	..

The histories of the fatal cases during the past year were:

1902, vol. ii., page 277. *Cholelithiasis; Empyema of Gall Bladder; Cholecystostomy; Myocarditis; Sudden Death eight weeks after Operation.*—Fanny L., 56 years old, housewife. For past four years she had suffered with repeated attacks of cholecystitic pain. Never was jaundiced. The present attack was of two weeks' duration, attended with large, painful tumor in region of gall bladder, and fever. The development of a hypostatic pneumonia prevented surgical interference. With the subsidence of the pneumonia the gall bladder tumor disappeared and a number of calculi were passed in the stools. Ten days later marked septic symptoms developed with fluctuating temperatures, necessitating urgent surgical interference.

On admission, November 17, 1901, the gall bladder was enlarged (size of an egg), tender and painful; heart the seat of marked myocardial changes; urine contained trace of albumin and few hyaline casts; temperature 101.2°, pulse 100.

Immediate laparotomy; cholecystostomy under chloroform and ether. Deep-seated gall bladder surrounded by old adhesions, necessitating careful dissection to expose it. Aspiration of the gall bladder yielded very foul fecal pus, bile-stained, giving rise to the suspicion of a communication between the gall bladder and colon. Incision of gall bladder, evacuation of its contents and numerous calculi and gangrenous mucosa. On account of the swelling of the mucosa of the cystic duct, fresh bile did not escape into the gall bladder. Drainage by tube. Partial closure of abdominal wound.

[4]Required a secondary choledochotomy for common-duct obstruction due to calculus.

[5]Discharged with a sinus; probably some obstruction in the ducts.

[6]Secondary operation.

[7]In one patient this was a secondary operation.

Reaction from operation good; temperatures never rose beyond 100 °. pulse rate between 100 and 112. Purulent discharge of fecal odor from the gall bladder, mixed with profuse discharge of bile, continued for six weeks. Throughout the entire period of after-treatment the patient was very nervous and exhibited indications of myocarditis in an irregularity of the pulse. The abdominal wound gradually contracted and closed; the gall fistula closed by January 1. On January 2 the patient developed a phlebitis of the right common iliac; this gradually subsided. January 10, patient was in excellent condition, wound almost healed, and was preparing to leave for her home the next day. Immediately after getting into bed in the evening she became pallid and cyanosed; pulse failed, and, in spite of free stimulation, death occurred within a few minutes.

Postmortem examination not permitted.

1902, vol. ii., page 274. *Acute Gangrenous Cholecystitis; Cholecystostomy; Pneumonia; Death.*—Bernard S., 47 years old, had never been ill until two days before his admission, when he began to have general abdominal pain, which localized itself to the right iliac fossa. He had a severe chill at the onset, and another the following day. Vomited repeatedly. No movement of bowels, in spite of cathartics and enemata.

On admission, March 12, 1902, his general condition was good. Internal organs normal. The abdomen was slightly distended; right rectus rigid; exquisite tenderness in right iliac fossa, extending into the loin; no tumor could be felt. Rectal examination negative. Temperature 103°, pulse 120.

Immediate laparotomy. Gall bladder surrounded by adhesions. Aspiration yielded foul-smelling, bloody fluid. Incision and evacuation of purulent contents and calculi. Drainage of gall bladder. Partial closure of abdominal wound.

Reaction from operation good. Fresh bile drained from gall bladder. Pneumonia of right lower lobe developed on March 14, from which the patient succumbed on March 23, 1902.

1902, vol. ii., page 279. *Cholelithiasis; Empyema of Gall Bladder; Cholemia; Cholecystostomy; Nephritis; Death.*—Elise G., 42 years old, had suffered with vague gastric symptoms and attacks of biliary colic for many years. The present attack was of eleven days' duration; was attended with high fever, 103°-104°, a distended and painful gall bladder, and jaundice.

On admission, December 5, 1901, the general condition was poor, patient was slightly jaundiced; temperature 102.8°, pulse 120. The abdomen was lax; gall bladder distended and painful. Urine acid, 1018, some hyaline and granular casts and bile.

December 5: Operation. Gall bladder surrounded by many dense adhesions; this viscus was tense; cystic duct much thickened; common

duct empty. Pancreas normal. Aspiration of gall bladder yielded mucus and bile. Incision and evacuation of numerous calculi and gangrenous mucosa and mucus. Drainage.

At first patient did very well. The temperature declined; bile was freely discharged from the gall bladder. The jaundice persisted; gradually her mental condition became clouded; she passed very little urine, became uremic, and died in coma on the seventh day.

1902, vol. ii., page 283. *Calculus in Common Bile Duct; Obstructive Jaundice; Choledochotomy; Secondary Hemorrhage; Death.*—Minnie S., 40 years old, housewife, had suffered with numerous attacks of biliary colic. During the last ten months these attacks were always associated with jaundice; attacks came on every ten days. She had lost much flesh during this time.

On admission, October 13, temperature 103°, pulse 124. Patient was in fair condition; was deeply jaundiced; liver somewhat enlarged; gall bladder not felt; pain and tenderness over gall bladder. Urine, acid, 1018; trace of albumin; few casts. Was put upon calcium chloride in thirty-grain doses three times a day. Temperature fluctuated between 99 + ° and 102°.

October 17: Operation. Choledochotomy and drainage; cholecystostomy and drainage. Gall bladder contracted and contained several calculi; surrounded by numerous adhesions. Common duct dilated and contained numerous (seven) calculi. Hepatic ducts empty. Drainage of common duct and gall bladder.

October 18: Considerable oozing of blood from wound, saturating the dressings.

October 19: Bloody expectoration. Secondary hemorrhage from wound in the evening. Exploration of the abdomen showed that this came from the cystic artery, which had been divided at the first operation, and from the entire surface of the gall bladder. Hemorrhage was easily controlled by suture.

October 20: Repeated vomiting of bloody material.

October 21: Oozing of blood from wound; continued hematemesis. Died.

No autopsy.

1902, vol. ii., page 282. *Calculus in Common Bile Duct; Obstructive Jaundice; Choledochotomy and Drainage; Persistent Gastric Hemorrhages; Death.*—Mary G., 44 years old, housewife, had suffered from attacks of epigastric pain at frequent intervals for the past year, one attack accompanied by jaundice. Three months before she had a severe attack of pain, followed by jaundice; the latter had persisted ever since; it varies in degree from time to time. Had several chills during this time; lost considerable weight and strength.

On admission, October 30, 1902, she was deeply jaundiced but in fairly good condition; internal organs normal; pulse soft and slow; hemic murmur at base and apex of heart. Liver somewhat enlarged;

gall bladder not felt and not sensitive. Temperature 98.8°, pulse 88. Urine normal. At once patient put upon calcium chloride, thirty grains every four hours.

November 3: Operation. Choledochotomy and drainage; cholecystostomy and drainage. Gall bladder contracted, surrounded by adhesions and containing numerous calculi; common duct dilated and contained one movable calculus. No calculi in hepatic ducts. Choledochotomy and cholecystostomy, removal of calculi, and drainage.

November 4: Vomited considerably; some oozing of blood through the dressings.

November 5: Vomiting continued in spite of lavage. Vomitus contained blood.

November 8: Vomited bright-red blood several times. Died. Temperature never above 102°; pulse rapid, 116-120-140. No evidences of peritonitis.

No autopsy permitted.

A REPORT ON 66 OPERATIONS FOR CHOLELITHIASIS UPON 61 PATIENTS TREATED DURING 1898 AND 1899 IN THE ENTIRE SURGICAL SERVICE AND DURING 1900, 1901, AND 1902 IN THE FIRST SURGICAL SERVICE OF THE MOUNT SINAI HOSPITAL.

By A. A. Berg, M.D.,
ADJUNCT SURGEON.

In the entire surgical service of Mount Sinai Hospital during 1898 and 1899, and in the First Surgical Division during 1900, 1901, and 1902, we have operated upon 61 patients for cholelithiasis and its complications. Upon these 61 patients 66 operations were performed, with a mortality of 18, or 29 + per cent. This high mortality needs a few words of explanation. It teaches in itself an important lesson to those who never advise surgical interference until the patients have become exhausted by the pain of repeated attacks of colic, or septic from cholangitis or suppurative inflammation of the gall bladder. The patients who come to the Mount Sinai Hospital are not of the class who select a quiescent period of their disease as a most fitting time for operation; they prefer, as a rule, to wait until threatening manifestations of intense sepsis, arising from cholangitis, gangrene, or empyema of the gall bladder, etc., compel them to seek the surgeon's aid. Thus, of our 61 patients, 19 had empyema of the gall bladder, 4 extensive

gangrene, 6 obstructive jaundice at the time of their admission. Only 20 were admitted in, or could be tided over into, a quiescent interval of the disease.

This delay in resorting to surgical interference until the exigencies of the case urgently demand it, accounts for the wretched physical condition in which our patients come to the hospital. They are mostly emaciated, nervous, and exhausted from their oft-repeated and prolonged attacks of pain, fever, and jaundice; their tissues frequently in a condition of fatty and hyaline degeneration, their kidneys functionally bad, and their hearts very often the seat of chronic interstitial changes. This accounts for the three deaths from collapse immediately or shortly after operation, even though the latter was not severe or unduly prolonged. Further, the resisting power of their tissues is so bad that bacteria which are present in the gall bladder find a favorable soil for rapid increase and development; thus 8 cases of rapid and fatal septicemia, with no peritonitis arising from septic foci in the gall bladder or ducts, occurred during these five years.

These facts show conclusively that if good results are to follow the surgical treatment of this disease, the patients must be operated upon early. In a previous communication the writer has stated the indications for the medical and surgical treatment to be as follows.[1]

Medical Treatment.—Cholecystitic pain or attacks of biliary colic, in either case unattended with fever.

Surgical Treatment.—

1. Operations of choice, undertaken in the quiescent period; mortality, 2-3 per cent.

   (a) Severe cholecystitic pain or oft-repeated, uncomplicated attacks of biliary colic, persisting in spite of medical treatment.

   (b) After the first attack of acute cholecystitis attended with fever.

2. Compulsory operations, undertaken at any time of the day or night, often amid unfavorable surroundings; high mortality.

   (a) Foudroyant or intensely acute attacks of cholecystitis.

   (b) Hydrops, empyema, gangrene, or perforation of gall bladder; cholemia; abscess of liver; diffuse peritonitis.

We *do not* advise surgical interference at the first attack of cholecystitic pain or biliary colic. We base this action upon our knowledge

[1]Medical Record, 1902.

of the genesis of the lesions that follow upon cholelithiasis. Calculi themselves do not give rise to any alterations in the gall bladder; the pathological changes are dependent upon a secondary or mixed infection of this viscus. A primary infection, of a diminished virulence, coupled with stasis of the bile, determines the formation of calculi within the gall bladder; a secondary infection of varying intensity of virulence determines the acute and chronic inflammatory conditions that result in marked structural alterations and general septic intoxication. The calculi, as foreign bodies in an irritable viscus, may excite cholecystitic pain or biliary colic; the secondary infection gives rise to hydrops, empyema, gangrene, cholangitis, etc.

Medicinal, dietetic, and hygienic therapy usually succeed in relieving the pain and colic in uncomplicated cases; surgical interference will only be called for when the pain is continuous and severe and is not benefited by general therapeutic measures. The addition of a secondary infection in a gall bladder the seat of calculi marks a strong indication for surgical interference. Our experience teaches us that sooner or later such a secondary infection will give rise to such severe local lesions and general intoxication as to demand operation. If the onset of severe local and general disturbances is to be forestalled, recourse to operation must be made as soon as possible after the inception of a secondary infection of the gall bladder.

As to Operation in the Acute Attack or during a Quiescent Period.

The surgeon naturally prefers to operate during a quiescent interval. At such a time the mortality is considerably less, and the search for stones in the gall bladder and ducts can be made much more thoroughly and satisfactorily. It is in the operations performed during an acute seizure that calculi are left behind in the gall bladder and ducts, necessitating secondary operations for their removal.

The gall bladder is not to be compared to the appendix vermiformis in regard to the urgency of operative interference during an acute period of inflammation. The walls of the latter organ, poor in muscular and elastic fibres, can distend very little to accommodate the products of inflammation that accumulate in it. With its orifice of exit closed, the rising tension of these confined products is very likely to result in perforation. The gall bladder, on the other hand, is rich in elastic and muscular tissue; its walls readily stretch and its cavity distends to accommodate the inflammatory exudates; perforation is

therefore comparatively rare. Whereas early operation is necessary in acute appendicitis, in order to forestall perforation, such action is not often required in acute cholecystitis. Immediate surgical interference is chiefly called for in the face of an advancing septic condition or in extreme distension of the gall bladder; otherwise it is usually safe to wait for a subsidence of the acute manifestations and operate during the quiescent period.

THE LATE RESULTS AFTER GALL-STONE OPERATIONS.

The subsequent histories of most of the hospital ward patients cannot be ascertained; they have either changed their places of residence or do not respond to our letters of inquiry. However, as a rule, we have found that our patients return to the hospital for examination, if they suffer from a recurrence of the old malady.

Of those returning to the hospital in this way, a number complained of dragging, dull pain in the right hypochondriac regions. The pain did not radiate; they stated that it was of an entirely different character from that with which they had previously suffered. These patients while under our observation never had an attack of biliary colic; no stones were passed in their stools; they were not jaundiced. After a time the pain became very much less; we considered it was due to the adhesions around the gall bladder and ducts. In a number of cases post-operative hernia through the scar followed. The herniæ were reducible in most of the cases. Radical operation was only once required, the hernia and its attendant unpleasantness being easily controlled by a well-fitting abdominal belt.

Six of the patients in this series had to be reoperated to remove calculi from the cystic or common bile ducts that had not been taken out at the first operation. In 4 of these cases the stones were impacted in the cystic duct; in 2 of the latter a previous cholecystostomy in two stages, and in 2 a cholecystostomy in one sitting, had been done; the impacted calculi could be easily felt with a probe introduced through the fistula in the gall bladder.

Another case, in which cholecystostomy had been done for empyema, returned to the hospital after several months with a diffuse purulent peritonitis originating in a rupture of a recurrent empyema. The gall-bladder fistula had completely closed, but the common duct was obstructed by a large calculus, which prevented the free discharge of gall-bladder secretions and bile into the duodenum. Immediate

laparotomy and drainage of the ruptured gall bladder and cleansing of the peritoneum saved the patient's life; and at a third operation the common-duct stone was removed, the patient making an uneventful convalescence.

In the sixth patient a cholecystostomy and cysticotomy had been done two years prior to her readmission to the hospital, when she presented all the indications of common-duct obstruction. The gall-bladder fistula had healed. Exploration revealed an impacted stone in the choledochus.

In the above patients there can be no doubt that the calculi which were removed at the second operation were present in the ducts when the first operation was performed. In 2 cases in which cholecystostomy in two stages had been done, the calculi could be felt impacted in the cystic duct when the gall bladder was opened. Though their dislodgment was repeatedly attempted, the efforts were not successful. In the other 2 cases of cholecystostomy evidence of the presence of obstruction in the cystic duct was afforded by the persistent patency of the gall-bladder fistula.

In the 2 cases in which at the secondary operations calculi were found in the common duct, the gall-bladder fistula had remained open for a long time. One patient remained well only eight months after its closure, when a rupture of the gall bladder occurred; in the other the fistula closed only after seventeen months, and from the time of its closure the patient complained of repeated attacks of biliary colic, chills, and fever. It is to be noted in these last 2 cases that the gall-bladder fistula closed some time after the primary operation—in one seventeen months, in the other about five months. Neither of these patients presented the symptoms of, or gave a history of, attacks of obstructive jaundice. The tardy closure of the gall-bladder fistula would indicate that the obstructing calculi were at first lodged in the cystic duct, and when they had passed into the common duct the gall-bladder fistula closed. Our experience would seem to show that obstruction in the common duct, unless it be a very firm impaction, does not interfere with closure of a gall-bladder fistula; whereas an obstruction of the cystic duct, where firm impaction is the rule, prevents such closure. Reference to this point will be made under cholecystostomy. To our knowledge, only one of the other patients in this series presented evidences of a return of symptoms due to the presence of calculi in the gall bladder or ducts; furthermore,

in all but this one of the remaining patients no biliary fistula remained after the primary operation. We must conclude, therefore, that a re-formation of calculi after they have been once completely removed must be a very rare occurrence; in this our experience coincides with that of Kehr. After a close investigation into the subsequent histories of patients operated upon by him for cholelithiasis, he was unable to find any instances in which a true re-formation of calculi occurred. In all his cases that presented evidences of new formation of calculi, he was able to prove that such calculi had been present at the time of the first operation, and had either been overlooked by the surgeon or their removal was deemed inadvisable on account of the poor condition of the patient or extensive adhesions around the ducts.

To avoid the repetition of this most disagreeable occurrence—viz., the overlooking of calculi in the bile ducts—we have of late followed in all our cases the following procedure: After opening of the abdomen the gall bladder is exposed and examined. If it is very tense, its contents are withdrawn with an aspirating needle, the puncture opening being then closed with a suture or clamp. This relief of tension within the gall bladder renders palpation of this viscus and the ducts much more easy and satisfactory. The exploring hand is then introduced into the abdomen along the under side of the gall bladder, and carried along the cystic and common bile and hepatic ducts. Where these structures are surrounded by adhesions the latter are divided until all the ducts are freely accessible. By rolling them between the fingers the smallest calculi are easily and readily located. In this way we ascertain at the very beginning of the operation the exact site of any calculi within the gall bladder and ducts: the hepatic ducts beyond the portal fissure of the liver cannot be palpated, and must, in case calculi are suspected in them, be probed to ascertain the presence of the latter. To make our exploration of the gall bladder more certain —for small calculi may, even with this procedure, escape detection— we always palpate the interior of the gall bladder after it has been incised; should the patient's condition or the presence of numerous adhesions around the ducts make it more advisable to postpone the removal of impacted stones in the cystic, hepatic, or common ducts to a subsequent time, we are in a position to know that a secondary operation will be necessary.

[1]Ueber Recidiv bei Gallensteinkrankheiten. Langenbeck's Archiv.

OPERATIONS UPON THE GALL BLADDER AND DUCTS.

Abdominal Incision.—We usually employ a straight longitudinal incision through the fibres of the right rectus muscle, commencing at the costal arch and extending downward for three or four inches, preserving intact the seventh and eighth dorsal nerves that pass across this field. Where more room than is afforded by this incision is required (*e.g.*, in very obese subjects), this is obtained by making a second transverse incision at right angles to the first one and bisecting it. In very obese subjects, and in those in whom the liver occupies a high position, a transverse incision below the costal arch is made. This affords excellent access to a contracted, deeply seated gall bladder and ducts, and does away with the necessity of resecting any of the costal cartilages. Post-operative hernia do not very frequently follow even extensive incisions in this part of the abdominal wall. We have seen several small hernia in very much relaxed and obese subjects.

The closure of the abdominal wound is made by layer sutures of chromicized catgut. In very fat subjects the layer suture is reinforced by several through-and-through silk sutures. Such through-and-through sutures have very frequently, in our experience, given rise to extensive stitch-hole abscesses, and even phlegmons. Though recognizing this great objection to their use, we do not dispense with them, because we have found nothing else to afford sufficient guarantee against a bursting open of the wound.

Cholecystostomy.—Was performed 38 times, with 27 recoveries and 11 deaths. Of these, 27 were done during the acute period, and 10 of them succumbed—two in collapse shortly after the operation, the other from a more or less rapid but progressive septicemia, no peritonitis. This would indicate that even a simple surgical procedure, performed at a time when there is a virulent infection of the gall bladder and ducts, is attended with great risks. It would seem as if the operative interference increased rather than diminished the intensity of the infection. The question naturally arises as to the advisability of performing cholecystostomy in the acute cases. We know that the simple incision and drainage of purulent collections or gangrenous areas in other organs—*e.g.*, the kidney or appendix—is not attended by results as good as those which the immediate removal of the affected organ accomplishes. The much-inflamed, often gangrenous organ, whose vitality is further impaired by the necessary operative manipulations, is an excellent culture ground for the bacteria which are present, and their

virulence is very apt to be much increased. Drainage of the gall bladder is often very unsatisfactory, on account of the numerous diverticula and sacculations that result from ulcerations and cicatrices within its cavity. Insufficient drainage and retention of the products of bacterial life result in a progressive septic intoxication to which the patients finally succumb. During the past year we have in three acute cases performed cholecystectomy. The three cases made a smooth and uneventful recovery. Naturally all acute cases are not suitable for cholecystectomy; for the separation of numerous and dense adhesions may spread the infection in the gall bladder to the ducts and peritoneum, or it may be too formidable a procedure for a debilitated or already septic patient to endure. It does seem, however, as though primary cholecystectomy would give better results than simple evacuation and drainage.

Technique of Cholecystostomy.—After opening the abdomen, the gall bladder is isolated and the surrounding adhesions divided. The contents of the gall bladder are then evacuated by an aspirating syringe, and the puncture opening temporarily closed by suture or clamp. The gall bladder and ducts are then carefully palpated and the presence of any calculi noted. The gall bladder is then incised at its fundus and the calculi within it removed. A large-sized tube is put down to the bottom of its cavity and the edges of the opening inverted around the tube by several rows of purse-string catgut sutures (*à la* Kader), as suggested by Kehr. The gall bladder is then attached to the anterior parietal peritoneum, and the outer wound closed, except at site of emergence of the drainage tube. The latter is retained *in situ* by a rubber tube which fits snugly over it, and which is split into two lateral halves for two-thirds of its extent; the lateral halves being fixed to the skin by strips of adhesive plaster. The discharges are carried away to a bottle hanging at the side of the bed, thus preventing soiling of the outer dressings. Drainage is maintained until the bile appears sweet and clean and the interior of the gall bladder takes on a healthy appearance. Where the gall bladder is deeply placed and cannot be brought up to the abdominal wall, the interval between it and the parietes is packed with gauze, which is made to surround the drainage tube.

The operation is never done in two stages. The objection to this procedure lies in the fact that where stones are impacted in the orifice of the cystic duct, they cannot be dislodged, and secondary operations

become necessary for their removal. In two of the four cases in which cholecystostomy was done in two stages, impacted stones were felt in the orifice of the cystic duct, but could not be dislodged through the fistula; secondary operations were required. A persistent fistula discharging mucus was observed in seven of the cases. In four of these secondary operations revealed an impacted stone in the cystic duct. In a fifth case, the persistence of a gall-bladder fistula, discharging mucus, convinced us of the existence of an obstruction in the cystic duct. Secondary operation was advised, but declined by the patient. The fistula has persisted now for nearly five years, constantly discharging mucus; recently a carcinoma of the gall bladder developed. With the old method of performing cholecystostomy, in which the edges of the incision into the gall bladder were attached to the fascia or skin, fistulæ were frequent, due to the mucosa of the gall bladder growing out and lining the margins of the drainage canal. Such fistulæ had no dependence upon obstruction in the ducts, and could be closed by plastic operations.

The persistence of a gall-bladder fistula seems to depend upon a complete closure of the cystic or common bile duct, either by calculi or strictures or kinks or external compression. As calculi in the common bile duct are not apt to be firmly impacted therein, but float up and down, according as it is distended or empty, they rarely cause a permanent complete closure of its lumen. The bile and secretions from the gall bladder from time to time are afforded free discharge into the intestine. Calculi in the cysticus, on the other hand, are very likely, from the structure of the duct, to become firmly wedged at one point and completely obstruct the channel. Our experience would go to show that where the persistence of the fistula is due to the presence of calculi in the ducts, the site of such calculi is in the cysticus. In two cases in which a fistula persisted for five and seventeen months, respectively, and then closed spontaneously, the calculi were found to occupy the common bile duct. It is more than probable, however, that these calculi originally and during the time of the persistence of the fistulæ were lodged in the cysticus, and that when they passed on into the choledochus the fistulæ closed. This assumption is strengthened by the fact that the fistulæ did not discharge pure bile, but a bile-stained mucus, showing that the cysticus was obstructed.

Cholecystectomy.—Was performed 6 times, with 5 recoveries and

1 death. The Mayo operation (extirpation of the mucous membrane of the gall bladder) was done 3 times, with no death.

Indications.—The Mayo operation is an excellent one in quiescent cases. It does not replace cholecystectomy in gangrenous or suppurative cholecystitis, nor in those cases in which the inflammatory process has extended beyond the lining mucosa of the gall bladder. It is especially valuable in those cases in which, as the Mayos suggest, it is desired to remove the gall bladder and drain the ducts at the same time. In an ordinary cholecystectomy the cystic duct is closed by ligature; if drainage is desired it is found very difficult to retain a tube in the cystic duct. In the Mayo operation the facilities for drainage are just as good as in an ordinary cholecystostomy, as the muscular tunic of the gall bladder affords an excellent pouch for collecting the secretions of the cystic and hepatic ducts, whence they are readily and easily conducted away. We would reserve the ordinary cholecystectomy for the acute cases of gangrenous or suppurative cholecystitis, employing the Mayo operation in the quiescent cases, with deeply-seated gall bladders, in which, besides removing this viscus, we desire to establish drainage of the hepatic and cystic ducts.

Technique of Operation.—Our method of performing cholecystectomy is as follows: A flap is formed on either side of the gall bladder, of its peritoneal covering, which serves to cover the bed of this viscus after its removal. The organ is then freed from its attachment to the liver; likewise the cystic duct. The cystic artery and duct are separately tied with catgut, and the gall bladder amputated distally to these ligatures. A small cigarette drain is passed down to the stump. Closure of the abdominal wound in layers.

OPERATIONS UPON THE DUCTS.

Cysticotomy.—Was done 4 times, with 3 recoveries and 1 death. The duct was drained in all cases; no permanent fistula remained. In all the cases the cysticotomy was a secondary operation, cholecystostomy being done primarily. Had cholecystectomy been done primarily these calculi could scarcely have been overlooked.

Combined cholecystostomy and cysticotomy was done in 2 cases; both succumbed, one in collapse shortly after the operation, the other from a rapid septicemia without peritonitis. It seems that operations upon the cystic duct, when it is deeply seated and surrounded by adhesions, are not well borne. The mobilization of the duct sufficient to

enable the operator to incise it is deeply shocking; furthermore, drainage is unsatisfactory, for the tube is very likely to be displaced. In acute cases it is much better to perform a cholecystectomy and then split up the entire length of the cystic duct, and in the quiescent cases to incise the gall bladder and cysticus throughout their entire extent, remove the calculi and extirpate the mucosa of the gall bladder, leaving the muscular tunic of the latter to serve as an aid to drainage.

Choledochotomy.—Was done 4 times; all recovered. In one of the cases a previous cholecystostomy and in another a primary cysticotomy had been done. Combined choledochotomy and Mayo's operation was done twice; both recovered. Combined cholecystostomy and choledochotomy was done 4 times; 2 recovered, and 2 died from continued capillary hemorrhage. Combined cholecystectomy and choledochotomy was done once, death being due to continued hemorrhage. Simple or combined choledochotomy was therefore done 11 times, with 3 deaths from continued capillary hemorrhage.

Hemorrhage in Jaundiced Patients. Persistent and uncontrollable capillary hemorrhage has been, and continues to be, the most lamentable sequela to operations in deeply jaundiced subjects. It is especially apt to follow when the cause of the jaundice lies in a malignant obstruction of the bile ducts. Its cause has been put down to a retarded coagulating capacity of the blood. It has been urged to improve this coagulating time of the blood by the internal administration of calcium chloride. Following this suggestion we have systematically administered the calcium salt in small and in large doses, and have in all cases given it at least one week before operation. Yet during the past year two of our cases succumbed from a persistent, uncontrollable capillary hemorrhage.

It seems to us that the cause of this continued, uncontrollable capillary oozing lies not so much in the retarded coagulation of the blood as in a fatty degeneration of the walls of the arterioles, which interferes with their contraction and retraction. Physiology teaches that the cessation of hemorrhage is due to two causes: chiefly and primarily, to the contraction and retraction of the arterioles into their sheaths, and, secondarily, to the clotting of the blood. It is hardly possible that a retardation in the coagulating time of the blood should be responsible for the persistent oozing that occurs in these cases; were this alone the cause we would expect that firm pressure over the bleeding part would arrest the oozing until coagulation occurred and

permanently checked the hemorrhage. This is not the case; the bleeding goes on in spite of pressure and in spite of coagulation, which can be rapidly induced by styptics, the actual cautery, etc.

On the other hand, it is well known that chronic jaundice causes an atrophy of all muscular tissue. Such atrophy of the muscular coat of the arteriole interferes materially with its contracting power. The arteriole, when divided, does not contract and retract within its sheath; its orifice remains patent, and no clot can remain firm over it, for the arterial pressure behind the clot forces it off as soon as it forms. To support the pressure there is need not only of a clot, but of a contracted and retracted arteriole.

If this explanation of the causation of continued hemorrhage be true, we would expect that the longer the duration of the jaundice the greater would be the tendency to bleeding, for the atrophy should be more marked. This is exactly so, as every surgeon has experienced. Furthermore, we should expect that as cancerous cachexia, chronic sepsis, and other debilitating influences add a fatty or waxy degeneration of the tissues to the atrophy, patients suffering from such conditions would be more apt to bleed than those who suffer from chronic jaundice alone. This, again, is substantiated by experience.

If we accept this degeneration of the blood vessels as the cause of this most terrible complication to operations upon such patients, we can readily account for the absolute failure of all therapy, including the administration of the calcium chloride, to check the hemorrhage. We shall have to expect that from time to time we shall encounter cases in which death will follow from persistent bleeding.

Technique of Choledochotomy.—A firm, hard, round cushion is placed across the lower dorsal region; the common duct is thus brought nearer to the anterior abdominal wall, and all the manipulations are thereby rendered much easier. The duct is then exposed and rolled between the fingers until it alone is grasped, the portal vein and hepatic artery being displaced to either side. The calculus is steadied between the index and middle fingers of the left hand, and the wall of the duct incised over it. The stone is removed with forceps or scoop. In only two of our cases was the duct sutured; no leakage of bile followed. In all the others the duct was drained. Should the stone occupy the retroduodenal part of the duct, it is displaced upward to the free portion of the latter as it lies in the gastrohepatic omentum. We have not had occasion to practise transduodenal choledochotomy.

Retroduodenal Choledochotomy.—Transduodenal choledochotomy, first suggested by McBurney, is an operation by which, according to the statement of those who have employed it, the removal of impacted stones in the retroduodenal and papillary portions of the common bile duct is readily and satisfactorily accomplished. Yet it is a procedure that is attended with sufficiently grave risks to cause us to resort to its use only when all other methods of removing the calculus from the choledochus have failed. The opening of the duodenum is always a serious procedure; the danger lies not so much in the possibility of peritoneal infection as in the insufficiency of the closing sutures. A very slight leak tends to become larger, spontaneous closure is most unlikely, and death from inanition would be the natural consequence.

The writer knows of one such case in which, after a transduodenal choledochotomy, a leak in the duodenum occurred and death from inanition resulted. Such insufficiency of the suture line cannot be attributed to an improperly placed suture; for it must be remembered that in these cases of long-standing, impacted calculi in the gall bladder and ducts, the peritoneal covering of these parts has been repeatedly inflamed, numerous adhesions have formed, and the peritoneum has lost to a considerable degree its quality of adhesiveness. This alteration in the peritoneum accounts for the failure of a very carefully and well-placed suture to effect a perfect closure of the duodenum. To obviate the necessity of opening the duodenum, the writer has thought of a retroduodenal route of attacking the retroduodenal and papillary portions of the common duct. This idea was strengthened materially by a recent publication of Kocher's in the *Centralblatt für Chirurgie*, 1903, No. 2: "Mobilisierung des Duodenums und Gastroduodenostomie." For the purpose of establishing gastroduodenostomy, Kocher has practised the mobilization of the descending portion of the duodenum, by which the latter is rotated around a longitudinal axis passing along its inner border. The entire posterior surface of this portion of the duodenum, and the retroduodenal structures, among which is the retroduodenal portion of the common bile duct, are thus exposed. The duct can here be grasped between the fingers, incised, calculi removed, and either sutured or drained.

The technique of mobilization of the duodenum, as given by Kocher, is as follows: Three or four cm. external to the right border of the

duodenum the posterior parietal peritoneum is incised in a longitudinal direction, extending from the flexure of the duodenum above to the transverse mesocolon below. The left side of the divided peritoneum is then elevated with the finger up to the right border of the duodenum. The finger now passes behind the duodenum, separating it from the vertebræ, inferior cava, and aorta, up to its inner border. The descending duodenum is then rotated to the left around its longitudinal axis, thus exposing the common bile duct from the duodenal flexure to its entrance into the duodenum. The pancreaticoduodenal artery lies anterior to the duct and separated from it about one-quarter of an inch. The accompanying veins lie just behind the duct; in some instances a branch of the vein crosses the duct just above its termination. The superior mesenteric branch of the portal vein lies considerably internal to the duct, and the vena cava is posterior to it. The duct is easily recognized; it can be grasped between the fingers, incised, and the impacted calculus removed. The site of the incision into the duct should be drained by a wick of gauze, and the duodenum allowed to fall back into its normal position; the choledochus is then incised higher up as it lies in the gastrohepatic omentum, and a tube inserted into this opening, thus establishing drainage of the hepatic ducts. The incision into the retroduodenal and papillary parts of the duct should not require suture.

The writer has had no opportunity to test the value of this operation in the living subject. By the kindness of Dr. Gallaudet, of the College of Physicians and Surgeons, an opportunity was afforded him of testing its feasibility upon the cadaver.

It was especially noted that the peritoneum in this region, and the descending portion of the duodenum, is very loosely attached to the posterior parietal wall, and its mobilization and reflection inward was easily and readily accomplished. In a subject with the arteries well injected, no vessels of any importance were encountered. The pancreaticoduodenal arteries lie about one-quarter of an inch in front of the duct and run in a course parallel to it. A small vein crosses the duct just before its entrance into the duodenum. The exposure of the retroduodenal structures was excellent and the manipulations with the duct easily carried out. Upon the cadaver the operation appears to be an eminently satisfactory method of access to the retroduodenal and papillary portions of the choledochus.

DISEASES OF THE PANCREAS—4 CASES: 2 DEATHS.

	Total	Cured	Improved	Unimproved	Died.
Acute pancreatitis[1]	1	..	..	..	1
Chronic pancreatitis and hepatitis; jaundice	1	1	..	..	..
" " jaundice	1	..	1	..	..
Carcinoma of pancreas	1	..	..	..	1

Operations for Diseases of Pancreas—3; 1 Death.

Cholecystendesis	2	1	1	..	..
Exploratory laparotomy for carcinoma	1	..	..	..	1

The two patients with chronic pancreatitis and jaundice gave the following histories:

1902, vol. ii., page 294. *Chronic Pancreatitis and Hepatitis; Jaundice; Cholecystendesis; Cured.*—Annie L., 45 years old, admitted August 7, 1902. Two years before, had an attack similar to the present one; it was marked by jaundice, chills and fever, and constipation; it lasted four weeks. Since then she was well up to four weeks before her admission. She was then taken sick with pain in right hypochondrium, had repeated chills and fever, and became jaundiced. Was constipated, and vomited at times.

On her entrance to the hospital physical examination showed her to be in fair condition, intensely jaundiced; temperature 103.4°; lungs normal; systolic murmur over apex and precordial region; liver slightly enlarged; spleen normal; abdominal wall rigid; marked resistance below liver; gall bladder not felt.

August 7-15: Temperatures fluctuated daily between 100° and 102 + °. Jaundice diminished somewhat. Urine contained albumin and casts.

August 12: Had a chill. Diagnosis: Cholelithiasis; stone in common duct; cholangitis. Was put upon calcium chloride, grs. xxx., on her admission.

August 15: Laparotomy. Right lobe of liver studded on its under surface with many small, hard nodules. Gall bladder surrounded by adhesions, otherwise normal; contained no calculi; no calculi in ducts; latter surrounded by few adhesions. Head of pancreas was harder and more nodular than normal; no neoplasm could be made out. Separation of adhesions around gall bladder and ducts. Closure of abdominal wound.

[1]Not operated.

Convalescence uneventful. Temperature subsided to normal after a week. Jaundice and tenderness in right hypochondrium disappeared. General condition improved. Discharged cured September 27.

Subsequent History.—Patient remained well for four months, then became jaundiced again, with fever and chills; *had disgust for meats; no sugar in urine.*

1902, vol. ii., page 301. *Chronic Pancreatitis; Obstructive Jaundice; Exploratory Laparotomy; Improved.*—Israel G., 37 years old, had a slight attack of jaundice, with pain in right hypochondrium, five years ago. This lasted one week. Had a similar attack six months ago. The present illness commenced two weeks before his admission on April 23, 1902, marked by jaundice and pain in right hypochondrium; stools clay-colored; no vomiting; no chills or fever; lost 20 pounds in weight in last six months.

On admission there was noted: Internal organs all normal. Indistinct mass in the right hypochondrium, not especially tender; appears to be continuous with liver. Leucocytes, 11,000. Temperature 100°-101°. Urine: albumin, casts, no sugar.

From April 23 to May 2 jaundice gradually increased; no new physical signs appeared.

May 2, 1902: Exploratory laparotomy. Liver enlarged downward; surface and free margin smooth. Gall bladder small and contracted. Behind the pylorus was felt a hard, nodular, spindle-shaped mass; it corresponded in position with the common duct. It was impossible to decide whether this nodular mass was a neoplasm or calculus; a few isolated nodules could be felt in lesser omentum. Closure of abdominal wound.

May 9: Wound closed per primam. Jaundice still present.

June 2: Jaundice disappeared; no cachexia; tumor in right hypochondrium larger and more nodular. Discharged improved.

1902, vol. ii., page 299. *Acute Hemorrhagic Pancreatitis; Death.*—Joseph H., 30 years old, was taken suddenly sick, three days before admission, with general abdominal pain, vomiting, and constipation; no chills or fever.

On admission, March 9, 1902, internal organs normal. Abdomen was distended; generally tender, especially in right iliac fossa; dulness in both flanks. General condition so poor as to forbid operative interference. Died same night.

Autopsy.—Liver: Enlarged; fatty; nutmeg. *Pancreas:* Somewhat enlarged, firm consistence, grayish color; surrounding it a large mass of blood which extended into the retroperitoneal tissues and between the layers of the mesocolon. Ducts of pancreas swollen; likewise the duodenal papilla. In the blood around the gland are chocolate-colored granules. Intestines normal. Mesenteric nodes normal.

DISEASES OF THE FEMALE GENITAL ORGANS[1]—17 CASES; 2 DEATHS.

	Total.	Cured.	Improved.	Unimproved.	Died
Chronic endometritis	1	1	..	..	..
Prolapse of vaginal walls (cystocele and rectocele)	1	1	..	..	..
Ruptured ectopic pregnancy	1	1	..	..	..
Catarrhal salpingo-oöphoritis	1	..	1	..	..
Pyosalpinx; pelvic peritonitis	1	1	..	..	..
" and ovarian cyst	1	1	..	..	..
Bilateral tubercular salpingitis	1	1	..	..	..
Tubo-ovarian abscess	1	1	..	..	..
Ovarian abscess; pelvic peritonitis	1	1	..	..	..
" " acute salpingitis	1	1	..	..	..
Right ovarian cyst with twisted pedicle	1	1	..	..	..
" " " " " " (dermoid)	1	1	..	..	..
Bilateral intraligamentous ovarian cysts	1	..	..	..	1
Traumatic rupture of uterus; hemorrhage; acute anemia	1	..	..	..	1
Fibroids of uterus	2	2	..	..	..
Epithelioma of cervix and endometrium	1	1	..	..	..

Operations upon the Female Genital Organs—16 Operations; 2 Deaths.

Curettage	1	1	..	..	..
Plastic operation for cystocele and rectocele	1	1	..	..	..
Laparotomy for ruptured ectopic pregnancy	1	1	..	..	..
" " diseased adnexa	6	6	..	..	..
" " twisted ovarian cyst	2	2	..	..	..
" " intraligamentous ovarian cysts	1	..	..	..	1
Hysterectomy for fibroids	2	2	..	..	..
" " epithelioma of cervix	1	1	..	..	..
" " ruptured uterus; acute anemia.	1	..	..	..	1

1902, vol. iii., page 412. *Bilateral Intraligamentous Ovarian Cysts; Death from Acute Septicemia.*—Mary L. suffered with pelvic pressure symptoms due to the presence of intraligamentous cysts on both sides.

April 24, 1902: Removal of cysts. Many dense adhesions to rectum and omentum and intestines. Closure of abdominal wound without drainage.

After operation, from which reaction was good, patient vomited re-

[1]These were either private patients or were admitted to the surgical service on wrong diagnoses. Diseases of the female genital organs are to be found in the Gynecological report.

peatedly; pulse increased in rapidity and lost in volume; no abdominal distension; no evidence of peritonitis; no exudate in peritoneal cavity; continuous vomiting; rapid pulse; temperature, highest, was 101.4°. Death forty-eight hours after operation.

Postmortem examination through wound.—No evidences of peritonitis; small amount of fluid blood in pelvis. Pedicles of broad ligaments normal; the suture of the left broad ligament had opened in part and exposed the retroperitoneal cellular tissue. In the bottom of Douglas' was an area, the size of a ten-cent piece, denuded of peritoneum.

1902, vol. iii., page 401. *Rupture of Uterus the Seat of a Hydatidiform Pregnancy; Hemorrhage into Abdominal Cavity; Acute Anemia; Hysterectomy; Death from Acute Anemia.*—Rachel C., 43 years old, housewife, had been well up to the day of her admission. That afternoon she called upon a physician, where she was examined. She considered herself pregnant several months. Upon her return home she felt well until the evening, when she suddenly collapsed. She vomited several times, and complained of severe abdominal pain. She was seen at her house about 1 A.M. in collapse; almost pulseless; abdomen full of fluid material; cervix soft; uterus enlarged midway to umbilicus; temperature subnormal. Immediate transference to hospital was decided upon, as preparation for operation in her house would have consumed three to four hours. She was admitted to the hospital one-half hour after she was seen in her home.

Immediate laparotomy. Abdomen full of fresh fluid and clotted blood. Tubes and ovaries normal. Two perforations, one on fundus and one on posterior wall of uterus, and each large enough to admit two fingers, were noticed. Fresh, profuse hemorrhage was going on from these perforations. In the pelvis were found a number of small cysts resembling hydatids, and a few of these cysts were in the mouths of the perforations. Gauze tamponade did not check the hemorrhage; the wall of the uterus was so brittle as to interfere with firm packing; this only made the openings larger. Hysterectomy at once performed. Four clamps controlled the ovarian and uterine arteries. Supravaginal amputation done; divided walls of vagina clamped; peritoneum drained from below by gauze; closure of abdominal wound, leaving clamps *in situ*. In spite of vigorous stimulation, the patient succumbed an hour after operation; the operation had lasted about fifteen minutes. Uterus size of cocoanut; on the fundus and in the posterior inferior segment were two large, ragged perforations. The uterus was the seat of a pregnancy of about two months. The latter was undergoing hydatidiform degeneration of chorion. Some of these hydatid cysts were found in the peritoneal cavity.

UNCLASSIFIED ABDOMINAL DISEASES—11 CASES: 1 DEATH.

	Total.	Cured.	Improved.	Unimproved.	Died.
Abdominal tumor[1]	1	..	..	1	..
Cystic sarcoma of omentum	1	..	..	..	1
Tubercular peritonitis	2	..	2	..	..
Post-operative adhesions[1]	1	..	1	..	..
Intra-abdominal abscess over the descending colon	1	1	..	..	..
Retroperitoneal sarcoma; metastasis in inguinal glands[1] and iliac glands	1	..	..	1	..
Large fibroma of abdominal wall involving entire rectus sheath	1	1	..	..	..
Lacerated and contused wound of abdominal wall.	1	1	..	..	..
Metastatic abscess of abdominal wall	1	1	..	..	..
Abscess of abdominal wall following operation.	1	1	..	..	..

Operations in Unclassified Abdominal Diseases—8 Operations; 1 Death.

Laparotomy and evacuation of exudate in tubercular peritonitis	2	..	2	..	..
Laparotomy for evacuation and drainage of intraperitoneal cystic tumor	1	..	..	..	1
Incision and drainage of intra-abdominal abscess.	1	1	..	..	..
Excision of large fibroma of rectus sheath and muscle; plastic operation on abdominal wall.	1	1	..	..	..
Suture of lacerated wound of abdominal wall	1	1	..	..	..
Incision and drainage of mural abscess	2	2	..	..	..

1902, vol. iii., page 311. *Cystic Sarcoma of Omentum; Laparotomy; Evacuation and Drainage of Cystic Contents; Death.*—Heinrich F., 58 years old, admitted August 16, 1902. For five months prior to this time his bowels had been alternately constipated and very loose; stools, when formed, were small but not ribbon-like. Evacuations contained at times mucus; never blood. Three months ago the abdomen became swollen to twice its normal size; during the past few weeks the swelling had entirely subsided. During the time his abdomen was swollen he passed little urine; the amount of the latter increased when the abdominal swelling disappeared. He was jaundiced two months ago; lately this has disappeared very much. No chills; no fever; no vomiting; no eructations. Had some pain in the right hypochondrium during the last week. Temperature 102.8°, pulse 100.

On examination there was noted some compression of the lower left

[1]Not operated upon.

lung. Heart normal. Liver somewhat enlarged downward. In abdomen was a large, smooth tumor in left hypochondriac and umbilical regions; it was hard and slightly irregular. The dull percussion over it was continuous with the dulness at base of left chest. Tumor painful and tender, especially just below the free border of the ribs and in epigastrium. The spleen was apparently pushed over to the right and was riding on top of the tumor. Urine acid, 1016; trace of albumin; bile; pus cells. Leucocytosis, 17,600. Aspiration of left chest yielded bloody fluid; aspiration of tumor through the tenth space in left axillary line yielded pus. Diagnosis: Subphrenic abscess due to pyonephrosis.

August 16, 1902: Operation. Under gas and ether anesthesia an incision was made in left lumbar region. Left kidney exposed; found normal. Left subphrenic space contained no pus. Peritoneal cavity was opened for exploration at anterior margin of lumbar incision. Large cavity lying at root of mesentery was located. Careful tamponade of peritoneal cavity by gauze compresses; evacuation and drainage of considerable purulent, bloody, malodorous fluid. Tube and gauze drainage. Partial closure of abdominal wound.

There was a profuse purulent discharge for the next few days; temperatures between 100° and 101°, pulse poor, 120. Gradual failure of pulse. Death on August 21, 1902.

Autopsy through wound.—Omentum was found to be coiled up into a large mass size of muskmelon. It was the seat of sarcoma. In the interior of the mass was a large cavity with necrotic walls. Metastases in liver and kidney. No peritonitis.

HERNIA—63 CASES; 5 DEATHS.

	Total.	Cured.	Improved	Unimproved.	Died.
Inguinal, single, uncomplicated	17	14	..	2	1
" double, uncomplicated[1]	12	10	..	2	..
" recurrent	3	2	..	1	..
" with complications	6	6	..	..	..
" strangulated	3	3	..	..	..
" " Richter's	1	1	..	..	..
" " Küster's	2	1	..	..	1
Femoral, reducible	3	3	..	..	..
" strangulated[2]	4	3	..	..	1
Umbilical	2	2	..	..	..
Ventral, spontaneous	2	2	..	..	..
" post-operative	7	5	1	..	1
Internal, strangulated	1	..	..	..	1

[1]One case a hernia *par glissement*. [2]One case with complications.

I. INGUINAL HERNIA.

(1) Uncomplicated Cases.

During the past year there were admitted to our service 29 patients with uncomplicated inguinal hernia, of which number 12 were afflicted with a hernia on both sides. Four of the patients were not operated upon; in some the proposed operation was rejected by the patient; in others, again, the desired operation was refused by the attending surgeons for good and valid reasons. Excluding these cases, our figures show that the radical operation for the cure of inguinal hernia was performed 35 times. Just as in previous years, the operation of choice was Bassini's. No figures are available regarding the final results, as but a very limited percentage of our patients could be secured for re-examination. In one case a slight recurrence was noted at the time of the patient's discharge. This happened to a patient who had had a very large, "sliding hernia" *(par glissement)* of the left side. In this case incipient recurrence was noted when the patient left the hospital.

We have to put on record one death following our operations done for the radical cure of hernia.

1902, vol. ii., page 240 *Reducible Inguinal Hernia; Bassini Operation; Intestinal Obstruction due to a Band; Secondary Operation (Laparotomy and Division of the Band); Death.*—Robert K., 49 years of age, was admitted to the hospital April 4, 1902, wishing to be relieved from the necessity of wearing a truss. The inguinal hernia of the right side was scrotal, reducible, and of about the size of a small hen's egg.

April 5: Under gas and ether the typical Bassini operation. The second day succeeding the operation the temperature was 101.8°. This was considered to be merely an "aseptic" form of fever, due to the absorption of a hematoma, or some other transient cause. Calomel, to be followed by a saline purge and an enema, was ordered, but was ineffectual. On the following day the patient vomited three times a dark-brownish, odorless fluid. His general condition began to fail. The temperature had receded, but the pulse ranged about 110. There was no distension of the abdomen, but it became evident that the patient was suffering from some form of intestinal obstruction, and a secondary operation was done.

An incision about six inches long was made in the median line, extending from the umbilicus downward. Distended loops of small intestine presented in the wound, and were traced to the point of constriction, which was situated in the pelvis. The constriction was a mechanical one, consisting of a firm fibrous band passing from the

sigmoid flexure to the right side of the pelvis, constricting several loops of intestine which had slipped through between it and the promontory of the sacrum. The band was divided between two ligatures, and thereby the strangulated intestines were released.

In the course of the operation the mesentery was split, but was promptly sutured; the serosa of one of the distended coils, being very friable, was also injured. During the attempts to repair it the lumen of the intestines was repeatedly entered. This loop was not returned, but was anchored to the incision and surrounded by packings. Partial suture of the abdominal incision. The condition of the patient had become very serious, necessitating a saline infusion and vigorous stimulation.

The patient reacted very poorly and died five hours later.

The postmortem examination revealed the following condition:

Heart: Fatty overgrowth, particularly over the right ventricle; the right auricle was dilated; fatty infiltration of the right ventricle; slight thickening of the edges of the tricuspid valve. Hypertrophy of the left ventricle; edges of the mitral flaps thickened; aortic valves much thickened and shortened. Some interstitial myocarditis, with cloudiness of the heart muscle. Coronary arteries normal. The aorta showed slight atheromatous changes.

Lungs: The lungs were congested and edematous, with emphysema of the upper lobes. Bronchial nodes enlarged and anthracotic. The trachea and bronchi contained frothy mucus.

The *spleen* was small and congested.

The *stomach* was markedly dilated.

Intestines: There had been a band, which was divided between two ligatures. One end of the band was located at the mesentery of the ileum, about 5 cm. from the ileocecal valve; the other end was attached to the lower part of the sigmoid flexure. The band consisted of fibrous tissue without lumen. The small intestines were very markedly dilated, beginning 30 cm. above the ileocecal valve; at this point there was a sharp margin, above which the intestine was markedly hemorrhagic up to the lower jejunum. The appendix was rudimentary. The colon was collapsed. There was some thickening and retraction of the sigmoid mesocolon.

Epicrisis.—If the history, the findings of the second operation, and the autopsy report are carefully considered, it must be concluded that the death of this patient was in no way connected with the primary operation. The constricting band was situated far from the seat of the operation. Its structure demonstrated that it must have existed for a long time prior to the Bassini operation. All the conditions favorable for the production of an intestinal obstruction had been present before operation. The question may be put, however, why

the intestinal obstruction should have occurred directly following upon a Bassini operation.

(2) Recurrent Hernia.

Three patients with recurrent hernia presented themselves for treatment. Two of these were operated upon successfully; the third one declined an operation.

(3) Inguinal Hernia with Complications.

Six cases of this nature presented themselves for treatment. In two of the cases the complications bore no relation to the hernia: the complications consisted of tubercular glands of the neck in one case, and a tuberculous ankle joint in another case. The remaining four cases are the following:

1902, vol. ii., page 238. *Congenital Inguinal Hernia on the Left Side; Complication, Incarcerated Undescended Testicle; Cure.*—S. H., 55 years of age, was admitted April 11 with the following history: Patient was always under the impression that he had only one testicle, viz., the right one, and since childhood has worn a truss on the left side because of the presence of a mass in the left inguinal region, which was regarded as a hernia. Four days prior to admission there appeared suddenly in the upper portion of the left half of the scrotum a small tumor, which could not be replaced. No vomiting occurred and bowels moved regularly.

On admission the left half of the scrotal sac was found very contracted; in its upper portion there was a small, ovoid, painful and tender mass (testis). No cord was to be felt. The mass could not be replaced into the inguinal canal; there was slight impulse on coughing. Temperature 100.8°, pulse 80.

After the subsidence of the acute symptoms under the application of an ice bag, patient was operated upon on April 7. The testicle was liberated as far as possible; an incision in the lower part of the scrotum was then made, and the testicle was brought out through this opening and anchored there by suture. (Method of Frank. The plan is to detach again and replace the testicle into the scrotum after adhesions will have formed.) This was followed by the usual steps of the Bassini operation.

The method miscarried, however. The atrophied testis sloughed, necessitating its removal on April 21. The hernia wound healed by primary union, and patient was discharged cured May 2.

1902, vol. ii., page 215. *Inguinal Hernia of Left Side Following an Alexander Operation four years ago, the Hernial Contents being Broad Ligament, Ovary, and Tube; Bassini Operation, preceded by a*

Salpingo-oöphorectomy through the Herniotomy Wound.—E. S., aged 35.

1902, vol. ii., page 236. *Oblique Inguinal Hernia; Complication, Hydrocele of the Cord; Bassini Operation; Cure.*—H. Z.

1902, vol. ii., page 237. *Oblique Inguinal Hernia; Transverse Ectopy of the Right Testis; Bassini Operation; Cure.*—M. F., aged 13. The hernia had existed since birth. On admission, August 3, the following facts were noted: The right side of the scrotum is poorly developed. In the upright posture a large hernia descends into the left half of the scrotum; it is easily reducible in the recumbent posture. The external inguinal ring is about one and a quarter inches wide at its base (Poupart's); its apex is rounded and fully one and one-half inches distant. The epigastric artery is felt pulsating at the inner side of the ring. The abdomen is flaccid, and the ring is so large that a finger can be readily invaginated into the abdomen, and in this way the fundus and left half of the bladder may be palpated.

At the bottom of the scrotum there is to be felt a fair-sized testicle, slightly softer than normal; its free concave border faces downward; from its right pole a normal cord runs upward close to the root of the penis, then curves sharply to the left and becomes lost in the external inguinal ring. Pressure upon this testicle elicits testicular sense. On slight coughing another rounded body descends into the "left" half of the scrotum, which also gives testicular sense, and from it another and distinct cord can be traced up to the left external inguinal ring. On violent coughing or straining, loops of intestine prolapse, pushing before them the smaller testicle, but not affecting the position of the larger stationary one. The external inguinal ring of the right side is very small; no cord can be felt to enter it.

Operation August 4, 1902. On laying the sac open it was found that both testicles were within it, each one having its own cord, and running up into the abdomen through the "left" external inguinal ring. Both testes were rather small; the cord of the upper and smaller one had a distinct mesentery, and could be traced within the abdomen across to the right side. The scrotum showed no evidence of division into two compartments. The external ring of the right side was exposed and palpated, and found closed; no cord to be seen on this side. The hernia being a congenital one, the sac was dealt with after the method of Longuet. The operation was finished by the usual steps of the Bassini operation.

Patient made an uneventful recovery and was discharged cured on August 20.

(4) Strangulated Inguinal Hernia.

During the year 1902 there were treated at the hospital six cases of strangulated inguinal hernia. Three of these cases were uncomplicated by any of the more serious structural changes in the hernial

contents, and were therefore treated by releasing the constriction and returning the contents to the abdominal cavity; they all made prompt recoveries. A fourth case (1902, page 243) is of interest because the patient was very old and feeble, because the hernia was of Richter's variety, and because the constriction was caused by the external inguinal ring. The two remaining cases (1902, pages 239 and 244) were herniæ of the so-called "inguino-superficial" type. One of these (page 239) resulted in prompt recovery. Its interesting details were published in the *New York Medical Record* of January 10, 1903. In the second case the resection of two feet of small intestine became necessary. Patient died the third day after the operation, of suppression of urine.

1902, vol. ii., page 244. *Strangulated Küster's Hernia; Herniotomy and Resection of Intestine; Death from Suppression of Urine.*— Lenah O., 50 years of age, was admitted to the hospital on the night of November 27. She has had an inguinal hernia of the left side for twenty-three years. In the beginning the hernia was reducible; in the last few years it has become irreducible. About two years ago signs of strangulation set in, but passed off. Three days ago, during an attack of coughing, the hernia suddenly became larger and painful; the bowels moved once on the second day, but not since. Patient has vomited repeatedly, but the vomit was not fecal in character.

Physical examination revealed well-marked emphysema and symptoms of advanced pulmonary phthisis. Abdomen lax and tympanitic. In the left inguinal region and above Poupart's ligament there was a large, sausage-shaped mass extending from the middle of the mons veneris to the anterior superior spine of the ilium. Palpation caused too much pain to permit definition of pedicle or ring. The tumor as a whole was slightly movable; gave a dull percussion sound; its extremities were cigar-shaped and appeared to be more movable than the middle. Its length was about eight, its width about three, its height about two inches. The femoral region appeared to be free. Temperature 98°, pulse 114, respiration 24.

General condition of the patient was so poor that an operation could not be even considered. Calomel and a high oxgall enema were administered and caused an abundant stool. This, the resulting laxity of the abdomen, and the physical characteristics of the tumor justified the conclusion that the hernia contained merely omentum. In the course of the day the patient's condition improved so much that an operation was decided upon.

Anesthesia; first local by eucaine, then chloroform. An incision was carried over the centre of the tumor parallel to Poupart's ligament. The exposed mass was cigar-shaped, had a short pedicle at the centre of its inferior surface. Its investments consisted of skin and

superficial fascia only. The pedicle entered the external inguinal ring. On incising the sac a small quantity of a sanguinolent fluid escaped. The bulk of the hernial contents consisted of a large mass of adherent omentum; in its centre, however, about five inches of small intestine were found. It was discolored, dark brown, and had lost its elasticity and glistening appearance. The constriction was exceedingly tight. To effect a release of the imprisoned gut, all the superimposed layers had to be freely divided. The mesenteric vessels of the constricted loop were thrombosed, the mesentery itself so brittle that it gave way to the slightest touch. The adjoining portions of the intestine were hemorrhagic. To operate in healthy tissues it became necessary to resect twenty-four inches of the small intestine. This was done in the usual manner, including a triangle of the mesentery. Union of the divided ends was effected by means of a Murphy button. Reposition of the united intestine, iodoform-gauze drainage leading to the button on both sides of the intestine. Resection of the omentum. Open treatment.

Patient reacted well after the operation. The quality of the pulse was fair, its rate 108. On the following day the pulse rose to 120 and became highly tense. Patient became restless and delirious, and ceased to breathe about thirty-six hours after the operation. Patient had discharged since the operation only four ounces of urine, and the activity of the kidneys could not be aroused by any of the usual methods.

Autopsy through the wound showed no leakage at the site of the button and no peritoneal irritation. It was discovered, however, that the intestine showed, for the distance of another twelve inches beyond the button, hemorrhagic changes. It is pretty certain that had the patient survived the suppression of urine she would have succumbed to peritonitis.

II. FEMORAL HERNIA.

(1) Reducible Femoral Hernia.

Of the three cases of reducible femoral hernia which presented themselves for treatment, one case was operated upon by the Bassini method and two cases after the method of Fabricius. All three cases gave temporarily good result.

(2) Strangulated Femoral Hernia.

Of the four cases of strangulated femoral hernia, two were uncomplicated and the patients made uneventful recoveries. In a third case (1902, page 252), which was complicated, the resection of a portion of the omentum became necessary, the vessels of which were completely thrombosed. In addition to this, as a result of local applications, the skin of the inguinal and femoral regions was gangrenous. It is not

surprising that the ligatures applied to the omentum became infected. This necessitated a second laparotomy, and most of the omentum had to be resected. It was riddled with multiple abscesses. The patient made a good recovery.

The fourth case was fatal; its history follows:

1902, vol. ii., page 253. *Intestinal Obstruction due to Spontaneous Reduction of a Strangulated Femoral Hernia; Laparotomy and Formation of an Intestinal Fistula; Death.*—Becky B., 40 years of age, was admitted September 29. Patient has had a reducible femoral hernia for six years. Twenty-four hours prior to admission the hernia suddenly became irreducible, with symptoms of strangulation. Since then patient complained of pain over the entire abdomen, which had become tender and very rigid.

Patient's general condition was poor, the face cyanotic; expression anxious; the tongue was moist and coated; the respirations were shallow and rapid (42); pulse small and could not be counted; temperature 102.6°. The abdomen, on percussion, dull in both flanks. In the left femoral region, just below Poupart's ligament, there was a soft, rounded mass; it was not tender to the touch, and was irreducible. Patient almost moribund.

In spite of all this, it was deemed a duty to relieve the strangulation of the intestine. Schleich's infiltration anesthesia. A longitudinal incision was carried over the prominence of the tumor. Rapid dissection revealed a large, empty hernial sac, through the ring of which a large amount of foul, brownish fluid leaked away. To expose the seat of the trouble the abdominal cavity had to be invaded. Median incision. Distended small intestine presented in the wound, and was traced downward until a collapsed portion was reached. Here a knuckle of intestine seemed to be constricted by a band. This being divided, however, it became evident that this could not have been the cause of the trouble. The distended intestine was now followed up in the opposite direction. High up, near the duodenal fossa, a completely gangrenous loop was reached. Its length was about eight inches. The gangrenous coil was attached to the external wound, the most of which was closed by suture.

Vigorous hypodermatic and intravenous stimulation did not succeed in terminating the collapse, and the patient died three hours after the operation.

No autopsy was permitted.

III. VENTRAL HERNIA.

(1) Spontaneous Ventral Hernia.

In the two cases of spontaneous median ventral hernia, plastic procedures involving the fasciæ of the recti were resorted to and yielded satisfactory results for the time being.

(2) Post-operative Ventral Hernia.

Of the seven patients suffering from post-operative ventral hernia that presented themselves for treatment, one declined operation, and another one died. The history of this case will be found below. The remaining number, mostly herniæ contracted after operations for appendicitis, were dealt with in this manner: The various layers of the abdominal wall were separated by careful dissection, after which the various planes were sutured in their anatomical order. In all of these cases the immediate result was good.

The history of the fatal case is as follows:

1902, vol. ii., page 256. *Ventral Hernia Following an Operation for Appendicitis (Kammerer Incision); Repair of the Abdominal Wall; Death from Diffuse Peritonitis.*—Henry B., 24 years of age, admitted April 3. He had been operated upon at this hospital, during March of this year, for appendicitis (interval). Ten days after this operation a small hernia appeared at the site of the incision. The scar became very painful, which made him seek relief.

April 4 a longitudinal incision was carried over the centre of the protrusion. Directly after incising the skin and superficial fascia, the omentum was reached, intimately adherent both to the superficial fascia and to the structures through which it passed. The hernia had no peritoneal sac. The liberation of the adhesions was very difficult. The anatomical relations had become so indistinguishable that the incision had to be extended both upward and downward. Thus the normal peritoneum was reached. The intestines were intimately adherent to the posterior surface of the omentum and to the abdominal parietes. The separation of all adhesions having been accomplished, a large section of the prolapsed omentum was resected. The wound was closed by exact suturing.

The hernial protrusion had evidently occurred in consequence of the giving way of the deep sutures, and the contents left the abdominal cavity through a peritoneal aperture. This explains the absence of a sac.

The day after the operation patient vomited repeatedly; temperature rose to 103.4°, pulse to 130; the abdomen became rigid, tender, and painful. The tension became so extreme that it was deemed proper, the following day, to remove the cutaneous sutures. Considerable bloody purulent fluid escaped from the subcutaneous space. The wound was packed and covered with a moist dressing. The patient's condition becoming worse, the entire wound was opened. A large amount of a grumous, bloody, and purulent fluid escaped from between the coils of intestine, especially from the pelvis and flanks. The intestines were coated with a fibrinous exudate; some coils were completely collapsed, others moderately distended. The abdominal

cavity was repeatedly flushed with saline solution until the fluid returned clear. Multiple drainage of the peritoneal cavity.

First the condition of the patient seemed to improve. The vomiting diminished in frequency (probably in consequence of repeated lavage). In the evening of the 8th patient became restless and delirious, and expired the same night.

IV. UMBILICAL HERNIA.

Two patients were operated upon. Omphalectomy, exposure of the various layers of the abdominal wall, and layer suture were employed. The immediate result was satisfactory in both instances.

V. INTERNAL HERNIA.

One case of strangulated internal hernia was admitted. The ring and hernial protrusion were situated in the anterior parietal peritoneum just above the bladder. The patient had declined to be operated on for three days, and consented only after fecal vomiting had set in.

1902, vol. ii., page 241. *Strangulated Internal Hernia; Relief of Strangulation; Obliteration of Sac; Death.*—Marcus D., 55 years of age, admitted to the medical service on April 5. Had been complaining for two years of digestive disturbances, eructation, abdominal distension, constipation, and loss of weight. For a number of years a double inguinal hernia was present. One week before admission the hernia of the left side suddenly became irreducible; after two days, however, it slipped back spontaneously. April 10 patient vomited once, but the temperature and pulse were normal. April 11 he vomited repeatedly foul fluid; abdomen became tender and the signs of a peritoneal exudate were found in the left flank. The distension increased markedly, but the patient declined an operation. The following day vomiting continued and became fecal. Finally the distension became enormous and the patient consented to an operation.

Operation. Chloroform anesthesia. The abdomen was opened in the median line below the umbilicus through a five-inch incision. Distended and congested but viable small intestines, together with coils of collapsed intestine, presented in the wound. The distended coils were traced downward until the obstruction was reached. A loop of small intestine was constricted by the firm fibrous neck of a small sacculation of the anterior parietal peritoneum just above the bladder. The incarcerated loop was easily withdrawn and was apparently normal. The ring was split and the sac obliterated by several tiers of sutures. Closure of the abdominal incision.

On the day following the operation the pulse became poor in quality, but responded to stimulation. In the evening the abdomen became considerably distended. Though the bowels moved, the distension returned almost at once. The pulse became weaker, and while at-

tempting to administer an intravenous infusion the patient suddenly went into collapse and died.

No autopsy was permitted.

DISEASES OF THE KIDNEYS—13 PATIENTS; 10 OPERATIONS; 3 DEATHS.

	Total.	Cured.	Improved.	Unimproved.	Died.
Nephroptosis; appendicitis	1	1	..	..	..
Ectopic kidney; acute nephritis	1	1	..	..	..
Cystic degeneration of kidneys	1	..	..	..	1
Perinephritic abscess	1	1	..	..	..
Nephrolithiasis	1	..	..	..	1
Suppurative nephritis; nephrolithiasis; cystitis[1]	1	..	..	1	..
Pyelitis[1]	1	..	1	..	..
Pyelonephritis[1]	1	..	..	1	..
Acute degeneration of kidneys, probably due to chemical causes; anuria	1	..	..	..	1
Urogenital tuberculosis	1	..	1	..	..
Tuberculosis of kidney	1	1	..	..	..
Neoplasm of kidney; hematuria[1]	1	..	..	1	..
Sarcoma of right kidney; metastatic growth of liver	1[2]	..	..	1[2]	..
Operations upon the Kidneys—10 on 9 Patients; 3 Deaths.					
Nephropexy and appendicectomy	1	1	..	..	..
Splitting both kidney capsules (Harrison) for anuria	1	..	..	..	1
Nephrotomy for anuria (cystic kidneys)	2[3]	..	..	..	1
" " calculi in pelvis of kidney	1	..	..	..	1
Nephrectomy; ectopic kidney	1	1	..	..	..
" tuberculous kidney	1	1	..	..	..
Double vasectomy for tuberculosis	1	..	1	..	..
Exploratory laparotomy; tumor of kidney and liver	1	..	..	1	..
Incision and drainage of perinephritic abscess	1	1	..	..	..

1902, vol. ii., page 344. *Nephroptosis; Chronic Appendicitis; Nephropexy; Appendicectomy; Cured.*—Sophie S., 21 years old, forewoman. Three years ago had an attack of severe pain in right iliac fossa, accompanied by chill, vomiting, and frequent urination. Kept to bed for one week. It took three months for her to recover her health. For ten months past has had intermittent pain in right side, its intensity increasing toward evening. Micturates every fifteen minutes during day; three to four times during night. Pain at beginning and at end of micturition. Lost flesh and strength. Is very nervous. Appetite good.

[1]Not operated upon.
[2]Transferred to medical service, unimproved.
[3]Two operations in one patient.

On admission there was noted slight dulness at left apex, with few coarse râles; faint systolic murmur at apex; liver and spleen normal. Right kidney can be felt as freely movable, smooth mass which can be readily replaced into the loin; it is of normal size. Pressure over McBurney's point rather painful.

August 11, 1902: Nephropexy; appendicectomy through longitudinal lumbar incision. Kidney delivered, capsule formed into two flaps, and these attached to lumbar fascia. Appendix removed through same incision; it was in a state of chronic inflammation. Uneventful recovery.

January 31, 1903: Kidney in good position; nervous symptoms much less marked; patient gained somewhat in weight.

1902, vol. ii., page 332. *Ectopic Sacral Kidney the seat of Acute Inflammation; Nephrectomy; Cured.*—Joseph S., 29 years old, a cloakmaker. Had an attack, similar to the one for which he came to hospital, ten days before. His present illness commenced twenty-four hours before admission. It was marked by severe pain in both lumbar regions, radiating into the groins. He had no chill, but some fever; vomited several times. Urination frequent and somewhat painful; no hematuria.

On admission, October 9, 1902, he was in fair general condition; his lungs, liver, and spleen normal. Heart: Disease of aortic and mitral valves. Abdomen: Entire right side rigid, but the lower half especially so; no free fluid; no tumor could be felt, on account of muscular rigidity; per rectum, high up above the prostate, a large, indefinite mass could be palpated. Temperature 103.4°, pulse 104.

Immediate operation was thought necessary, as an acute empyema of the appendix could not be excluded. Abdomen opened on right side by Kammerer incision. Appendix found free and normal in appearance; it was deligated and removed. Exploration revealed a mass in the median line, over the lumbosacral junction, covered by peritoneum. By placing the patient in Trendelenburg's position this mass was easily exposed; for further exploration its peritoneal covering was split longitudinally. The mass was at once recognized as a kidney; it was firmly lodged at the lumbosacral junction; its vessels came from the aorta in two large branches; it was cubical in form, hilus to inner side; the veins ran lengthwise along the hilus; no marked surface depressions. While examining the organ a large renal vein was torn. The cortex was so friable that with the most gentle manipulation a deep rent into it was made. The bleeding from these sources was very profuse, and could not be controlled by clamp or tampons. After determining the presence and consistence of the remaining kidney by palpation through the abdominal wound, nephrectomy was done. The pedicle was secured with heavy catgut. Some aberrant arteries at upper pole were also ligated. Cigarette drain to stump; layer suture of abdominal wall. Uneventful convalescence.

Pathologist's report of kidney: Acute degeneration and inflammation.

1902, vol. ii., page 333. *Acute Degeneration of Kidneys; Total Anuria; Splitting of Both Kidney Capsules (Harrison); Death.*—Samuel S., 33 years old, was operated upon for appendicitis one year before. Three days ago he suddenly experienced a burning pain in abdomen, followed by vomiting. The vomiting was frequently repeated. The bowels did not move. No fever, chills, or jaundice.

On admission, lungs, heart, and internal organs normal. He had passed no urine in the last twenty-four hours. Catheterization yielded one drachm of urine. Temperature 100.4°.

Hot packs, enemata, irrigations of intestines, medication, etc., did not succeed in starting up the secretion of urine. As a *dernier ressort* the splitting of both kidney capsules was done. Under local anesthesia the kidneys were exposed and capsules split. The kidneys both showed markedly increased intracapsular tension and were very brittle.

June 19: No urine was secreted during the next two days; gradual stupor; coma; death.

Autopsy through the wound.—Right kidney: Large, firm, not very hard; capsule not adherent; cortex of normal thickness; pyramids congested and studded with punctate hemorrhages; calices and pelves normal; ureter pervious. *Left:* Slightly larger than right; otherwise the same conditions as in the right kidney. Other organs normal. *Microscopical examination of kidneys:* Acute degeneration with granular changes in epithelium; marked congestion.

1902, vol. iii., page 335. *Nephrolithiasis; Nephrolithotomy; Drainage; Infection of Kidney; Death from Sepsis.*—Sarah S., 26 years old, a domestic, suffered from attacks of nephritic colic on right side for three years. She passed small calculi at various times. Fever during some of the attacks. Never had hematuria. Urine turbid and contained pus.

On admission internal organs normal. X-ray examination of right kidney showed shadow of stones corresponding to position of pelvis. Right kidney palpable, but not enlarged. Urine acid, 1030; pus and red blood cells; no casts; no tubercle bacilli. Temperature 100°, pulse 100.

June 4: Nephrotomy under gas and ether. Development of kidney somewhat difficult on account of perinephritic adhesions. Section of kidney while an assistant compressed the vessels at the hilus. Large number of stones removed from the pelvis and a few from the parenchyma; they varied in size from a split pea to a marble; some were lodged in the cortex near the periphery. Suture of kidney, drainage of pelvis, anchoring of organ to quadratus lumborum muscles, and partial closure of outer wound.

June 5: Temperature rose to 103.6°. Vomited repeatedly. Passed

twelve ounces of urine which was acid, 1030; trace of albumin; red and white cells; no casts.

June 6: Temperature high, 103 + , pulse 120. Vomited several times. Wound laid open: small collection of pus at lower end of wound and within the capsule: the latter was necrotic. The cut section of the kidney showed numerous scattered purulent areas. Free drainage.

June 7: Patient passed very little urine—nine ounces in twenty-four hours. Temperature 103 + , pulse 120. Wound showed extensive necrosis. The onset of uremic symptoms, together with anuria, prompted a splitting of the kidney capsule on the other side (Harrison). The uremic state became deeper, and death from sepsis occurred June 8. No autopsy.

1902, vol. iii., page 337. *Tuberculosis of Left Kidney; Nephrectomy; Cured.* Henry B., a clerk, of Savannah, Ga., suffered for six years from attacks of pain in the left lumbar region, at times radiating downward into the bladder and thigh. The pain was severe, and lasted one to two days. Did not recollect ever having passed bloody urine. The latter was dark brown, malodorous, and cloudy. He was told that he passed gravel four months before his admission. His family history was tuberculous. He had lost weight and suffered considerably, especially in last few months.

On his admission, April 19, his internal organs were normal. The left kidney region was tender and painful; no tumor could be felt. The urine was acid, 1024; faint trace of albumin; few pus cells; mucus; no tubercle bacilli could be found on repeated examination; total amount of urine, 35 to 40 ounces; urea, 2 per cent.

April 21, 1902: Exploration of left kidney under gas and ether. Usual kidney incision. Development of the organ difficult on account of numerous adhesions, especially around upper pole. The kidney was enlarged, lobulated; at its upper pole was a fluctuating area which contained pus. The ureter was much dilated. Nephrectomy was decided upon and carried out. Vessels of pedicle separately tied with heavy silk. The ureter was stripped out of its bed as far as its pelvic portion, and then ligated and removed. Cigarette gauze drainage. Closure of outer wound in usual manner. Uneventful convalescence. Discharged cured May 17, 1902.

Autopsy of Kidney.—Large abscess at upper pole; several small cheesy foci in its vicinity. Ureter thickened and dilated, and constricted near its pelvic portion. Tubercle bacilli found in kidney pus.

1902, vol. iii., pages 334 and 342. *Bilateral Cystic Degeneration of Kidneys; Oliguria; Double Nephrotomy; Death.*—Joseph E., 42 years old, was first admitted on December 31, 1901. With the exception of slight gastrointestinal disturbances, his previous history was negative. During the past eight weeks urination was difficult and painful, and in the last week there was almost constant vesical

tenesmus. No chills, sweating, or fever. Had pain in left lumbar region; no uremic symptoms; edema of legs. During the last two days he voided two glassfuls of urine.

On admission he was in fair condition; tongue moist and coated; no edema of legs or feet; breath urinous; diminished breathing and dulness at bases of both lungs. Liver, spleen, and heart normal; no accentuation of basic cardiac sounds; pulse of slightly increased tension. Abdomen: A swelling in left lumbar and hypochondriac regions, corresponding to left kidney. Prostate normal. Temperature 98.6°, pulse 100.

During the first six hours of his stay in the hospital he passed but one and a half ounces of urine; this contained some blood cells and pus cells, no casts. The administration of diuretics and infusion of digitalis and rectal saline injections, rapidly restored the kidney function. During the next twenty-four hours he passed 187 ounces of urine, which was clear, acid, 1014, some albumin, no casts.

The kidneys continued to functionate well, and the tenderness of the left kidney diminished. A small stone was passed per urethram on January 2. The diagnosis of calculous pyelonephritis of left side with oliguria was made, but, on account of a diphtheria epidemic in the ward, operation was postponed; the patient was discharged and told to report at a subsequent time. On January 11, 1902, he returned to the hospital. He had passed no urine in twenty-four hours, and had severe pain in left kidney region. Pulse 108, temperature 102.6°.

Examination showed the presence of a large, globular, slightly tender mass corresponding to left kidney. The administration of saline enemata, diuretic mixtures, and cathartics did not restore the kidney function. No urine was secreted during twelve hours. On the basis of a calculous pyelonephritis being the cause of the anuria, a nephrotomy of the left kidney was decided upon.

January 12, 5 A.M.: Under chloroform this was performed. The fatty capsule was edematous; kidney was large, of soft consistence, surface cystic. Aspiration withdrew turbid, yellow fluid, odorless, containing 0.8 per cent. of urea. The pelvis of the kidney was distended with the same sort of fluid, and in it were lodged several calculi. The organ was split, the stones removed, and free drainage established. There was very little hemorrhage during the operation. Following the operation the patient vomited a number of times and hiccoughed almost incessantly. Kidney function could not be reestablished, in spite of the administration of saline enemata, saline cathartics, diuretics, etc. Temperature 100°-102°, pulse 120. In the late evening of January 12 the right kidney was also split and drained. The organ was cystic, resembling a bunch of grapes, but there were no calculi in its pelvis. A vomiting and incessant hiccough continued. A free urinous discharge soaked the dressings; no urine passed into the bladder. Gradually the symptoms of uremia developed, and death occurred January 18, 1902.

Autopsy through wounds.—Right kidney: Eighteen cm. long; capsule adherent. Entire organ studded with cysts varying in size from a pea to a walnut; some of these contain bloody fluid, others clear, serous fluid. Between the cysts is apparently normal cortical substance. The pelvis contained a small, soft stone. *Right ureter:* Much thickened; lumen dilated, and contained several soft stones, which seemed to completely stenose the canal. *Left kidney:* Same as on right side; no calculi in ureter or pelvis.

PERINEUM AND MALE GENITALS. TOTAL, 106; DEATHS, 5.

	Total	Cured	Improved	Unimproved	Died
Vesical calculi	1	1	..	..	..
Cystitis, chronic	1	1	..	..	..
" tuberculous	2	1	..	1	..
Carcinoma of bladder	4	..	2	1	1
Tumor of bladder	1	..	..	1	..
Papilloma of bladder	1	1	..	..	..
Retrovesicular inflammatory exudate	1	..	1	..	..
Seminal vesiculitis, tuberculous	1	..	..	1	..
Hypertrophy of prostate	11	4	2	1	4
" " " and vesical calculi	2	1	1	..	..
Tumor of prostate	1	1	..	..	..
Tuberculosis of prostate and seminal vesicle	2	..	1	1	..
Gonorrheal prostatitis	1	..	1	..	..
Urethritis, acute, non-specific	1	1	..	..	..
" " gonorrheal	2	..	2	..	..
Periurethral abscess	2	2	..	..	..
Perineourethral fistula	2	1	1	..	..
Stricture of urethra	7	5	2	..	..
Redundant prepuce	1	1	..	..	..
Hematoma of corpus cavernosum	1	..	1	..	..
Varicocele	4	3	..	1	..
Hydrocele	1	1	..	..	..
Suppurating epididymo-orchitis, pelvic abscess	1	1	..	..	..
Thrombosis of spermatic vessels	1	1	..	..	..
Fissure of anus	2	2	..	..	..
Fistula in ano	11	11	..	..	..
Hemorrhoids	29	29	..	..	..
Ischiorectal abscess	4	4	..	..	..
Carcinoma of rectum	5	1	1	3	..
Pruritus ani	2	1	1	..	..
Proctalgia	1	..	..	1	..

HYPERTROPHY OF PROSTATE—11 CASES; 4 DEATHS.

Eleven patients with hypertrophy of the prostate were admitted during the past year. Upon these patients the following operations were performed: perineal prostatectomy four times, with two deaths; suprapubic prostatectomy twice, with no deaths; Bottini's operation twice, with one death; suprapubic cystotomy, removal of calculus and

drainage, twice, with no deaths; irrigation of the bladder, one case, with one death. The material is altogether too small to permit of our making definite deductions. It is to be noted that of the four cases discharged as *cured*, in two the prostate was removed by the suprapubic and in two by the perineal route; in the two cases discharged as improved, suprapubic cystotomy and drainage had been done, principally for the removal of calculi from the bladder; the one case discharged as unimproved refused treatment; and, finally, of the four cases which terminated fatally, in two the prostate had been removed by the perineal route, in one Bottini's operation had been done through a perineovesical fistula, and one case had received only vesical irrigations. The histories of the cases with a fatal termination were as follows:

1902, vol. iii., page 365. *Hypertrophy of Prostate; Operation, Perineal Prostatectomy; Death.*—Louis R., 62 years of age, was admitted to the hospital September 7 with the following history: Patient had gonorrhea twelve years ago. He had some difficulty with micturition during the past eight or nine years; the more acute disturbances date back only five days, since which time there is a more marked frequency in urination, accompanied by severe pain in the hypogastric region and in the glans penis. During the past three days the urine has been quite bloody, and the tenesmus has increased to such an extent that the patient attempts to empty his bladder on an average every twenty minutes; unless this is done there is continuous dribbling.

On examination there were found marked signs of advanced atheromatosis; the general condition was considered fair. Locally the prostate was found to be hard, and so much enlarged that its upper limits could not be palpated. The prostatic urethra was so long that in order to evacuate the bladder an ordinary catheter had to be introduced practically to its full length. An attempt was made to explore the bladder for calculi, but an ordinary Thompson's searcher could not be rotated in the bladder because of the length of the urethra. Only one ounce of residual urine was found; the urine was ammoniacal and alkaline, 1018, contained albumin, and on microscopical examination there were found pus and red blood cells, bacteria, and triple phosphate crystals. The case was judged to be eminently suitable for prostatectomy, and this operation was performed on September 8 by the perineal route. The operation, done through a curved incision, was comparatively easy; the prostate, fully the size of a lemon, was enucleated from its capsule; a median lobe, about the size of a thumb, was also readily extirpated. Tube and gauze drainage.

Patient reacted well after the operation. At the first dressing, one week later, the perineal wound was covered with a peculiar thin,

superficial slough. At no time was there any elevation of the temperature above 100.5°, nor was the pulse rate above 92. On September 18, twelve days after the operation, the patient was allowed to leave the bed. His general condition, however, began to deteriorate. He was very restless and at times slightly delirious; this was thought to be due to absorption of iodoform, and from this time on the wound was dressed only with sterile gauze. The patient was up and about daily, but began to lose ground, and finally died on October 3, twenty-five days after operation.

Autopsy was not permitted. In absence of a postmortem we must assume that death was due to chronic sepsis.

1902, vol. iii., page 366. *Hypertrophy of Prostate; Operation, Perineal Prostatectomy; Death from Pneumonia.*—Jacob R., 60 years of age, was admitted to the hospital October 30, 1902, with the following history: He had been troubled for over one year with very frequent and painful urination, the pain localized in the perineum and glans penis. Continuous dribbling of urine necessitated frequent catheterization. Considerable residual urine. The urine was acid in reaction, 1006, contained albumin, and deposited about a quarter of an inch of pus on standing; microscopically many pus and epithelial cells.

At the time of admission the general condition was found to be fair, though slightly senile. The internal organs, with the exception of sclerotic arteries, were normal. By rectal palpation the prostate was found to be very hard, about the size of a lemon, with its vertical diameter approximately two and one-half inches long.

Operation October 31. The operation was attempted through a median perineal incision; but this did not afford sufficient space, and therefore a transverse incision was added. The two lateral lobes of the prostate were enucleated subcapsularly and without injury to the urethra; the urethra was then incised in the median line, the bladder explored, but no stone was found. Tube and gauze drainage.

On the day following the operation the temperature rose to 101.2° and the pulse to 120; the tongue was very dry and the pupils much contracted; the patient was stuporous. The condition resembled one of opium poisoning, and on inquiry it was learned that the patient had been given a considerable quantity of morphine prior to admission. A diffuse broncho-pneumonia developed; the respirations increased to 40 and were very labored; the patient refused all nourishment; the pulse gradually became weaker, and he died on November 9, eleven days after operation. No autopsy was permitted.

1902, vol. iii., page 367. *Hypertrophy of Prostate; Operation (Bottini); Death from Lobar Pneumonia.*—Isaac G., 60 years of age, was admitted to the hospital February 24, 1902, with the following history: For about one and a half years patient had difficulty with urination, which has become progressively worse and is accompanied

by considerable pain. About twelve hours before his admission to the hospital, patient was suddenly seized with severe pains in the hypogastric region and inability to void urine spontaneously; an attempt to catheterize him was made at his home, but this was unsuccessful, and was followed by a hemorrhage from the urethra.

On examination at the time of admission the bladder was found to be enormously distended, reaching nearly up to the umbilicus. The passage of a soft rubber and a Mercier catheter was impossible, on account of a false urethral passage; a metallic catheter, however, was introduced readily and 27 ounces of a foul and bloody urine evacuated. By rectal palpation a hard, symmetrically enlarged prostate was found.

The patient was cystoscoped on February 28. The ureters could not be clearly defined; the prostate was enormously enlarged, and behind and below the prostate, at the base of the bladder, there appeared an irregular, roughened, and elevated area, of a dark-brown color, with numerous scattered, whitish spots over it, which had all the appearances of a neoplasm. Further investigation into the nature of this condition was deferred until the exploratory suprapubic cystotomy.

This operation was performed on March 3. On opening the bladder, however, no tumor was found; what simulated this tumor was only the hypertrophied median lobe. A Bottini operation, with the assistance of direct vision through the suprapubic wound, was done. This was not entirely satisfactory, because the instrument refused to work properly. Suture of the bladder wound around a catheter introduced for the purpose of drainage.

During the night following the operation, there occurred so much bleeding into the bladder that it became necessary to reopen the vesical sutures and to tampon the incised prostate. Thereafter there occurred no material complications until March 14, when the patient developed a lobar pneumonia in both lower lobes, to which he succumbed on the 17th. No autopsy was permitted.

1902, vol. iii., page 368. *Hypertrophy of Prostate; Pyuria; Urinary Sepsis; Death.*—Zacharias D., 89 years of age, was admitted to the hospital on January 3. His condition was one of pronounced sepsis, having its origin in the urinary tract, and caused by a hypertrophied prostate. Owing to the advanced age and poor general condition of the patient, he was treated only palliatively, with regular catheterization and irrigation of the bladder. Patient died four days later in a septic condition.

TUMORS OF THE BLADDER—TOTAL, 6; DIED, 1.

Six cases of this nature presented themselves for treatment. In one the exact nature of the tumor was not ascertained, as patient left the hospital declining operative interference; in one a papilloma of the

bladder was extirpated, and the patient was discharged cured; in four cases the tumor was carcinomatous.

One of the latter was considered absolutely inoperable, and patient was discharged; in another the tumor was explored by the suprapubic route, but was found to be too extensive to permit of its complete removal. The bladder was drained for a while, and after the wound had firmly united the patient was discharged. In a third case the carcinomatous masses were curetted away, but the subsequent treatment was the same as adopted in the previous case. The fourth case terminated fatally. The history was:

1902, vol. iii., page 351. *Carcinoma of the Bladder; Operation, Extirpation and Drainage of Bladder; Death.* Joe S., 25 years of age, was admitted to the hospital July 29 with the following history: Never had syphilis; gonorrhea eight years ago; eight months ago internal urethrotomy was done for a stricture. Five months ago he was treated with irrigations for a cystitis (?) accompanied by hematuria.

The present history dated back three months, at which time he began to complain of severe pain in the perineum, radiating down into both thighs; this pain increased markedly on urination, particularly at the beginning of the act. The urinary stream is moderate in size; there is no sudden stoppage. For the last three weeks partial incontinence, especially at night. The patient urinates every hour during the day and every half-hour during the night. The urine is cloudy, bloody, and foul-smelling, alkaline in reaction, 1014; contains albumin, many pus, red blood, and epithelial cells.

On examination the following condition was found: The inguinal lymphatic nodes were enlarged. Rectal palpation revealed the presence of a hard, firm prostate of the size of a small lemon; a narrow stricture about seven inches from meatus. This examination was followed by an attack of urethral fever.

Operation August 1. A preliminary perineal section revealed a new growth of the bladder; its removal was effected through a suprapubic incision. The bladder was filled with a large, friable mass attached to the trigonum by a rather large pedicle; the mass was removed by morcellement, and the pedicle was then thoroughly curetted. Drainage by means of tube and gauze. The wounds granulated nicely.

Ten days after the operation there developed signs in the right lung which indicated a metastatic growth of this part. The general condition of the patient thereafter rapidly deteriorated, and he died on August 18.

Postmortem examination showed a rapid recurrence of the growth in the bladder. In the apex of the right lung several cavities containing a necrotic grumous material; a similar cavity in the middle lobe in communication with a large bronchus.

CARCINOMA OF THE RECTUM—5 CASES.

Of the five patients with carcinoma of the rectum, three were discharged unimproved; two declined operative interference, while the third was inoperable. In one of the others a colostomy in two stages was performed, and patient was discharged with a well-functionating artificial anus. In the fifth case (1902, page 47), a woman 47 years of age, the entire tumor, comprising the lower end of the rectum and the sphincter ani (upon which it had encroached), was extirpated by the method of Rehn. To establish some continence of the sacral anus, the rectum was twisted 270 degrees around its own axis (Gersuny). The operation was done on March 7, 1902. The patient presents herself from time to time for examination. There is as yet (eleven months after operation) no recurrence. Perfect continence for hard and soft feces, but not for very fluid stools.

UPPER EXTREMITY—21 CASES; 2 DEATHS.

	Total.	Cured.	Improved.	Unimproved.	Died.
Abscess of axilla	1	..	1	..	..
Adenoma of shoulder, recurrent	1	1	..	..	..
Angioma, cavernous, of palm	1	1	..	..	..
Defect of palmar integument, traumatic	1	1	..	..	..
Defect of integument of arm, post-operative	1	1	..	..	..
Dislocation of shoulder, old	1	1	..	..	..
Fracture of humerus, compound	1	1	..	..	..
Necrosis of acromion process	1	1	..	..	..
Edema of arm, traumatic	1	1	..	..	..
" " " after amputation of breast	1	1	..	..	..
Osteomyelitis of humerus, acute	1	..	..	..	1
" " " chronic	4	4	..	..	..
Phlegmon of forearm	2	1	..	..	1
Tuberculosis of wrist joint	1	..	1	..	..
Webbed fingers and supernumerary digit	1	1	..	..	..
Wound, lacerated, of fingers	1	..	1	..	..
" " " palm	1	1	..	..	..

A case of lacerated wound of the palm with a large defect of the integument presents interesting features. Its history is therefore detailed below:

LACERATED WOUND OF PALM; DEFECT OF INTEGUMENT.

1902, vol. iii., pages 476 and 480. *Lacerated Wound of the Fingers and of the Palm; Conservative Treatment; Plastic Operation to Cover*

the Extensive Defect; Cure. David S., 29 years of age, baker, admitted November 25, 1901. Eight days prior to admission his left hand was caught between the steam rollers of a kneading machine the accident causing a contused and lacerated wound of the palm and fingers. Directly, in another hospital, partial suture of the wound was done. Three days before admission the hand began to swell and became painful.

On admission temperature was 101.6°, pulse 96. On the left hand a large area involving the entire palm, extending to the web line of the fingers and including the anterior surface of the wrist, was denuded of its integument. This raw surface was granulating in a few places, but most of the surface was necrotic. The flexor tendons of the fingers were exposed in the bottom of the wound, and were sloughing; the muscles of the thenar and hypothenar eminences were lacerated and contused. A smaller denuded area was to be seen on the dorsum of the hand. Epitrochlear and axillary nodes of the corresponding side were enlarged.

Under wet dressings, and after numerous minor operations to improve the drainage, the condition of the palm improved so far that the patient, on January 5, 1902, was put under ambulatory treatment.

Readmitted on January 19, 1902, he was operated upon January 20. The hand was prepared as follows: The granulations covering the defect were removed with a curette, then the integument surrounding this area was raised and turned back. Then a bridged flap, about ten inches long, three inches wide, and having a straight upper and a convex lower border, was mobilized upon the left buttock. The hand was then slipped under this flap, so that the defect was apposed to the raw surface of the cutaneous flap. This was retained by a few silk sutures. The denuded area on the buttock was diminished as much as possible by suture, and was covered over with strips of rubber tissue, across which were drawn broad layers of iodoform gauze. The arm was then bandaged to the trunk.

After the operation some oozing was detected on the margins of the dressings; the oozing was steady and progressive, and the pulse also became weaker. This necessitated revision of the wound four hours after the operation. Large blood clots were turned out from under the flap, but no active hemorrhage was found.

The subsequent course was marred by an intercurrent iodoform dermatitis and pyocyaneous infection. This did not, however, interfere with the viability of the flap. Under cocaine anesthesia the inner pedicle of the flap was divided on January 29, and on February 1 the outer pedicle was divided. The cut surfaces bled freely on both occasions.

The flap united very firmly with the denuded area, but it was too thick. To reduce it to the level of the skin it was excavated. The further course was uneventful, and patient was discharged, with excellent function, on March 9.

No notes are made here regarding the cases of osteomyelitis, fractures, and dislocations. They will be considered with the corresponding topics of the lower extremity.

LOWER EXTREMITY. TOTAL, 63; DEATHS, 4.

	Total.	Cured.	Improved.	Unimproved.	Died.
Abscess of buttock	1	1	..	..	..
Abscess of thigh, tuberculous	2	1	1	..	..
Angiolipoma of knee	1	1	..	..	..
Bursitis, prepatellar, suppurative	2	2	..	..	..
Ankylosis of knee joint	1	..	1	..	..
Contusion of leg	1	1	..	..	..
Coxa vara, traumatic	1	..	..	1	..
Exostosis of femur	1	1	..	..	..
Fibrosarcoma of thigh	1	1	..	..	..
Foreign body in thigh	1	1	..	..	..
Fracture of neck of femur, intracapsular	1	1	..	..	..
" " femur	2	1	1	..	..
" " tibia	3	3	..	..	..
" " " compound	1	1	..	..	..
Gangrene of foot, endarteritic	1	1	..	..	..
" " " diabetic	1	..	..	..	1
Genu valgum	1	1	..	..	..
Gonorrheal arthritis of Chopart's joint	1	1	..	..	..
Lipoma of buttock	1	1	..	..	..
Lymphadenitis of groin, suppurative	4	3	1	..	..
Malunion after fracture of femur	1	1	..	..	..
Myxosarcoma of thigh	1	1	..	..	..
Necrosis of femur	1	..	1	..	..
Osteomyelitis, acute, of great trochanter	1	..	..	..	1
" " " tibia	1	1	..	..	..
" chronic, of femur	2	1	1	..	..
" " " tibia	2	2	..	..	..
" " " astragalus	1	..	1	..	..
" " " os calcis	1	1	..	..	..
Perforating ulcer of great toe	1	1	..	..	..
Phlegmon of thigh	1	1	..	..	..
" " leg	1	..	..	..	1
" " foot	2	2	..	..	..
Sarcoma of femoral glands, secondary	1	..	..	1	..
Sarcoma of head of fibula	1	1	..	..	..
Suppurative gonitis	1	1	..	..	..
Tenosynovitis of ankle	1	..	1	..	..
Tuberculosis of hip joint	3	..	1	2	..
" " ankle joint	1	..	1	..	..
" " metatarsophalangeal joint of great toe	2	1	..	1	..
Ulcer of leg, varicose	2	1	1	..	..
" " " specific	1	..	1	..	..
Varicose veins of leg	4	3	..	1	..
" " " " thrombosed	1	..	..	..	1
Wound, incised, of leg	1	1	..	..	..

TUMORS OF THE LOWER EXTREMITY. TOTAL, 7.

Lipoma of buttock—1 case.
Sarcoma of femoral region, recurrent—1 case.
Fibrosarcoma of thigh—1 case.
Myxosarcoma of thigh—1 case.
Exostosis of femur—1 case.
Angiolipoma of knee—1 case.
Sarcoma of the head of the fibula—1 case.

The seven cases of tumors of the lower extremity are of sufficient interest to deserve mention. With the exception of one patient, all were operated upon, the operations being conservative. In three cases the tumors were of a benign character. In these the interest is operative only. In one instance the tumor was of recurrent type, the primary growth having been extirpated five years ago. This one was a fibrosarcoma of the thigh. Subsequently the patient returned with an inoperable recurrence of the femoral glands and spinal metastases. A case of sarcoma of the head of the fibula gave, after local removal, an excellent result.

1902, vol. iii., pages 461 and 470. *Fibrosarcoma of Thigh; Local Extirpation of the Tumor; Discharged, temporarily cured. Readmission, less than four months later, with an Inoperable Recurrence in the Femoral Glands and with Metastases of the Spine.*—Jacob K., 25 years of age, was admitted to the hospital on November 12, 1901, with a tumor situated on the inner aspect of the thigh at about the junction of the middle and lower thirds. This tumor was first noticed about two years ago, and had gradually increased until it had reached its present size of a cocoanut. The mass was fairly movable, hence extirpation was attempted, this being the only operation the patient would consent to.

Operation November 18. The tumor was exposed through a longitudinal incision on the inner aspect of the thigh. It was attached to the gracilis, adductor magnus, sartorius, and semimembranosus muscles, and, to insure its radical extirpation, portions of these muscles had to be sacrificed. Closure of the incision with partial drainage.

Primary union resulted, and the patient was discharged December 3, only to return on March 25 with a recurrence of the malady in the femoral glands, and with positive signs and symptoms pointing to a metastasis in the spine. Patient was transferred to the Montefiore Home.

1902, vol. iii., page 460. *Myxosarcoma of Thigh; Operation, Extirpation of the Tumor; Cure.*—Fanny N., 44 years of age, was ad-

mitted November 11, 1901, with a tumor in Scarpa's triangle. The tumor was of two years' duration and was recurrent, the primary growth having been operated upon three years before. It was the size of a fist, was firm and easily movable upon the deeper tissues, not adherent to the skin except in the line of the old cicatrix.

November 15: Extirpation of the tumor, including a portion of the sartorius. Discharged cured December 15.

1902, vol. iii., page 475. *Congenital Angiolipoma of the Knee: Operation, Partial Excision and Multiple Ignipuncture; Cure.*—Mendel B., 17 years of age, was admitted to the hospital April 10, 1902, with the following history: Since birth there had existed a swelling on the inner side of the knee joint, which had gradually increased and became very intumescent after exertion, likewise during the erect posture. In the past two months the swelling had become very painful, so as to incapacitate him for active work.

On examination an irregular swelling upon the inner side of the knee joint was seen, covering an area of four by six inches. The swelling was soft on palpation, with scattered cord-like structures (vessels) running into and through it in all directions. The swelling increases to about double its size on standing, and then it also assumes a bluish color. No pulsation, no bruit, and no glandular enlargements.

Operation April 14. Under artificial anemia and by an elliptical incision, the major portion of the tumor was excised. Most of the vessels were found to be thrombosed. Ignipuncture of the remainder of the mass with a fine-pointed Paquelin burner. Suture of the wound.

A rather copious secondary hemorrhage occurred about a month after the operation. It was controlled by pressure, and the patient was discharged cured on June 9.

1902, vol. iii., page 453. *Exostosis of Femur: Extirpation; Cure.*—Abraham K., 19 years of age, was referred from the medical to the surgical service of the hospital with a painful, hard swelling, about the size of a walnut, located on the inner aspect of the lower end of the femur. Operation September 8. Extirpation of the overlying bursa and removal of the tumor with the chisel. Patient was discharged cured September 24.

VARICOSE VEINS OF THE LEG—TOTAL, 7; DIED, 1.

Seven cases of varicose veins of the lower extremities, with or without ulcerations, presented themselves for treatment. In five cases operations were performed, viz., three times resection of the internal saphenous vein (Trendelenburg's operation); once Schede's method—viz., making a circular incision around the entire circumference of the

leg, tying all the vessels, and suturing the wound—and twice extirpation of all dilated veins.

This small number of cases operated upon is hardly sufficient to permit of definite conclusions, but it may be permissible to give in brief our experience with these operations; and it might be stated that the following conclusions are based not only upon the work reported for this year, but upon that of all our past experience.

1. The *Trendelenburg operation* is very easy to execute and can be done with local anesthesia. We perform it in the following manner: Before the operation the patient is directed to stand up, so that the internal saphenous vein may be mapped out readily in the upper third of the thigh. After disinfection of the skin, a few minims of a 1 per cent. solution of cocaine are injected along the course of the vein, and an incision about two inches long is made. The vein being exposed, two catgut ligatures are applied and the intervening inch of the vein is resected. This method is particularly suitable in those cases where Trendelenburg's phenomenon is present. This is elicited by emptying the vein by elevation, then compressing it at the saphenous opening. If now this pressure is released, the vein will be seen immediately to distend. Where this phenomenon was present the result was good, with one exception. Recurrence was noted in the case of Raphael A. (1902, page 427), in which the Trendelenburg phenomenon had been undoubtedly present.

2. *Schede's operation*, which consists of an incision encircling the leg, penetrating to the fascia. All structures, except the long saphenous nerve, are divided, the numerous vessels are tied, and then the incision is closed. This operation necessitates general anesthesia. As to the ultimate result, we can say that in our cases it was good, but the cure was very tardy; this was on account of the slow disappearance of the edema of the foot and ankle.

3. *The extirpation of all the varicose veins.* This method also demands general anesthesia and requires considerable time for its execution. The final outcome is excellent. One of the cases in which this method was employed had a fatal issue. Death, however, was not caused by the operation, but occurred as a consequence of intercurrent disease ten days after the operation, probably due to embolism of the pulmonary artery.

1902, vol. iii., page 431. *Infected and Thrombosed Varicose Veins of the Leg; Excision; Death from Embolism of the Pulmonary*

Artery.—Gevonine G., 65 years of age, was admitted September 24 with the following history: Patient had been complaining for about ten days of general malaise, loss of appetite, and vomiting. During this time he also had repeated sensations of cold followed by fever, but no actual chill. The last five days he complained of severe pain in the right calf. Redness and swelling in this region. The opposite leg was also painful.

On examination the following condition was found: On the right leg, over the belly of the soleus muscle, there was a large, red, brawny, tender area involving the entire calf, along the lower border of which tender and thrombosed varicose veins could be felt. On the left leg the external saphenous vein and its branches were thrombosed; the connecting vessels between the external and internal saphenous veins were marked by extensive periphlebitis. Both the femoral and posterior tibial vessels appeared to be normal. Temperature 103.2°, pulse 96.

At first the treatment consisted in elevation of the leg and the application of ice bags. The symptoms of local and general infection continuing, an operation was decided upon.

September 25: Extirpation of all the veins of the external saphenous system up to the deep popliteal vein. They were filled with semi-solid black thrombi; their walls were thickened and infiltrated. The external saphenous vein was much dilated, and was, as far as its entrance into the popliteal vein, filled with a solid, black thrombus.

Directly after the operation the temperature and the pulse dropped to the normal standard and remained there. The patient continued to improve and took ample nourishment; the wound itself looked very well, when on October 5, or ten days after the operation, the patient suddenly complained of pain in the abdomen and immediately thereafter died. No postmortem was permitted.

FRACTURES AND DISLOCATIONS. TOTAL, 11.

Following is a record of the major fractures and dislocations which were under treatment at the hospital during the past year:

Compound fracture of the humerus—1 case.
Old dislocation of the shoulder—1 case.
Fracture of the neck of the femur, intracapsular—1 case.
Fracture of the shaft of the femur—2 cases.
Fracture of the tibia—3 cases.
Fracture of the tibia, compound—1 case.

And for the sake of completeness we may also consider under this heading the following two cases:

Traumatic coxa vara—1 case.
Malunion after fracture of the femur—1 case.

In the reports of past years attention has been called to the fact that this branch of surgery is, numerically, not well represented at the hospital. The reasons therefor have been explained. The history of the case of malunion after fracture of the femur is detailed below. It presents certain features of interest.

1902, vol. iii., page 443. *Fracture of the Femur; Malunion; Osteotomy and Suture of the Fragments; Local and Systemic Infection; Cure.*—William B., 10 years of age, was admitted to the hospital on January 22, 1902, with a history of having been run over by a wagon the previous evening.

On admission a fracture of the thigh at the junction of the middle and lower thirds was found. Shortening of 4.5 cm., and an effusion into the right knee joint, were also present.

The injured extremity was immobilized in a plaster dressing, the dislocation of the fragments having been apparently reduced. On the twentieth day the dressings were removed, when the presence of a vicious union of the fragments was ascertained. The upper fragment had shifted forward and was overlapping the lower one. There was present also shortening to the extent of 4 cm. Breaking up of the malunion and the attempt at retaining the fragments in place by traction having failed, operative interference was decided upon.

Operation March 3. A longitudinal incision on the outer aspect of the thigh, exposing a large, deformed callus. This was chiselled away, and thus the ends of the fragments were exposed. Removal of a considerable portion of the shaft and much forcible distraction were needed to bring about juxtaposition. The fragments were held in position by two lateral lamellæ of sheet lead, lashed with stout silver wire, above and below the line of union. Drainage and closure of the wound, with the application of a suitable splint, concluded the procedure.

Two days after the operation the temperature rose to 104.2°, with a corresponding increase in the pulse rate. The wound being dressed, infection was noted; a culture showed the presence of staphylococcus albus. By March 10 an extensive phlegmon of the outer side of the thigh had developed, demanding free incision. It was seen then that the two lamellæ of lead had been displaced and valueless, hence they were removed. Retention of the fragments was accomplished by traction and external pressure by splints suitably fashioned and padded.

The patient continued to run high temperatures for a long time, requiring frequent and troublesome dressings; finally, however, the suppuration was overcome, and the bone ultimately united, a few sequestra of small size having been removed in the meantime. The patient was discharged in good condition, but with a shortening of 2 cm.

OSTEOMYELITIS—TOTAL, 13; 2 DEATHS.

Chronic osteomyelitis of the humerus—4 cases.
Acute osteomyelitis of the humerus—1 case.
Osteomyelitis of the great trochanter—1 case.
Chronic osteomyelitis of the femur—2 cases.
Chronic osteomyelitis of the tibia—2 cases
Acute osteomyelitis of the tibia—1 case.
Chronic osteomyelitis of the os calcis—1 case.
Chronic osteomyelitis of the astragalus—1 case.

As is seen by above list, there were treated at the hospital during the past year 13 cases of osteomyelitis of the larger bones. Of this number there were 3 which belong to the acute infectious form, viz., one of the humerus, one of the great trochanter of the femur, and one of the tibia. Only one of these patients recovered. In this case amputation of the femur was done for acute osteomyelitis of the tibia.

The histories of the two fatal cases were these:

1902, vol. iii., page 491. *Acute Septic Osteomyelitis of the Humerus; Staphylococcemia; Incision and Drainage; Death.*—Annie K., 9 years of age, was admitted August 21 with the following history: One week ago patient began to complain of pain in the right axilla, which, next day, extended to the arm. This was considered to be a "growing pain." Four days ago she had a chill, followed by a rise of temperature to 107° F., accompanied by restlessness and vomiting. Yesterday pain in the right leg set in also.

On admission the temperature was 104.4°, pulse 128, respiration 28. Physical examination revealed the following status: General condition fair, well nourished. The child looked decidedly septic. The tongue was dry and coated with brown fur; lips dry; teeth covered with sordes; the face was flushed. Slight macular eruption on the abdomen. One ecchymotic spot in the lower conjunctiva of the right eye. Examination of the internal organs negative. Right arm: A diffuse swelling extending from the shoulder to the upper third of the forearm; this swelling was red, hot, edematous, and in its upper part exquisitely tender. The shoulder and elbow joints were not involved. The right extremity was rigid, on account of the inability to move the hip actively or passively. Blood culture revealed the presence of staphylococcus aureus.

Immediate operation. A longitudinal incision was made over the outer aspect of the right arm, evacuating much pus from extra- and subperiosteal cavities. The bone was laid open by the chisel down to the medulla, which appeared discolored and very soft. This being scooped away, the cavity was packed with iodoform gauze. Several counter-incisions were made for drainage, and the limb was dressed.

An exploratory incision was also made over the great trochanter of the right side, but here nothing abnormal was found. The wound was sutured.

The septic state remained unrelieved, and the child died two days later. Autopsy was not permitted.

1902, vol. iii., page 448. *Osteomyelitis of the Great Trochanter; Incision and Drainage; Development of Septic Multiple Neuritis; Death from Exhaustion.*—Fanny G., 18 years of age, was admitted to the medical side of the hospital April 4, 1902. Ten days ago chilly sensations, followed by fever and sweating. Six days ago the patient began to complain of pain in the left thigh and knee. This joint became inflamed and swollen. Temperature 104° F.

Until April 23 she remained in charge of the medical service, where increasing leucocytosis and an extensive bedsore over the sacrum had developed. On that date she was seen by Dr. Gerster and was transferred to the surgical service with the diagnosis of osteomyelitis of the great trochanter. The great trochanter and upper end of the shaft of the femur were laid open by chisel and mallet. The integument and muscles were very edematous, but the medulla presented no marked change. Drainage and open treatment.

Extensive necrosis of the fasciæ followed; the bedsore spread; other bedsores developed; finally septic peripheral neuritis set in. Patient died June 24. No autopsy was permitted.

AMPUTATIONS. TOTAL, 5; 1 DEATH.

Exarticulation at elbow joint for extensive phlegmon—1 case.
Amputation of leg (Bier) for tuberculosis of ankle joint—1 case.
" " *thigh for acute osteomyelitis—1 case.*
" " " " *endarteritic gangrene of leg—1 case.*
" " " " *diabetic gangrene of leg—1 case.*

The method of Bier was once employed, and an excellent stump, with perfect function, was the result.

One of the patients (1902, page 416) suffering from a diabetic gangrene of the leg (1½ per cent. of sugar), and whose thigh was amputated, died, two days after the operation, of diabetic coma.

PHLEGMONS AND ABSCESSES. TOTAL, 7; 2 DEATHS.

Phlegmon of forearm—2 cases.
Abscess of buttock—1 case.
Phlegmon of thigh—1 case.
Phlegmon of leg—1 case.
Phlegmon of foot—2 cases.

Operative procedure in extensive phlegmons is so well understood and so uniform that it is unnecessary to dwell on it. However, the disorder is very important and demands earnest study and prompt and intelligent action. The seriousness of the disorder is aptly illustrated by the experiences of last year. In one of our cases (1902, page 482) the process was so progressive that an exarticulation at the elbow joint had to be done. Two of our patients died in consequence of systemic infection, demonstrated by blood cultures made immediately after their admission.

1902, vol. iii., page 484. *Phlegmon of Hand and Forearm; Repeated Operations; Death from Sepsis.*—Jennie S., 35 years of age. There was no history of a traumatism. About one week ago patient began to feel pain in the right index finger. After the lapse of four days the finger was incised by her physician. Immediately after that the swelling began to spread to the hand and forearm.

On admission, January 28, 1902, the temperature was 102°, but it soon rose to 106°, pulse 120, respiration 28. A small, longitudinal incised wound was seen on the palmar aspect of the right index finger. The tissues of the finger were boggy and edematous, and, by pressure upon the palm, pus could be squeezed into the wound. The hand and forearm were swollen and hard, and very painful and tender.

Immediate operation. The index finger and hand were laid open on their palmar aspect; much necrotic tissue was exposed. Drainage. Next day condition worse; multiple incisions along palmar side of hand; tube drainage. This did not stay progressive sepsis; patient died twenty-four hours later. Blood cultures taken during life showed the presence of staphylococcus aureus.

1902, vol. iii., page 422. *Phlegmon of Foot and Leg; Repeated Operations; Death.*—Rebecca C., 38 years of age. Present trouble of four weeks' standing. It began with a painful swelling around the right ankle; no traumatism. Repeated chills followed by high temperatures had occurred.

On admission, December 25, 1901, temperature was 103°, pulse 130, respiration 28. An extensive phlegmon involving the right ankle joint, and considerable edema and lymphangitis extending up to the knee joint, were found.

Immediate multiple incisions, evacuating large amounts of pus. Drainage by tubes and gauze. A remission of the temperature following the operation was evanescent. Recurrence of the fever induced repeated revisions of the wound and new incisions January 8, 14, 20, and 24. On the 26th patient suddenly died. No autopsy was permitted.

PELVIS AND SPINE. TOTAL, 8; 1 DEATH.

	Total.	Cured.	Improved.	Unimproved.	Died.
Osteomyelitis of sixth cervical vertebra	1	1	..	..	..
Tuberculosis of lumbosacral vertebræ	1	1	..	..	..
Fracture of spine	1	..	1	..	..
Metastatic sarcoma of spine	1	..	..	..	1
Lumbar abscess	2	1	..	1	..
Sarcoma of pelvis	2	..	..	2	..

1902, vol. iii., page 534. *Metastatic Sarcoma of the Spine; Death from Sepsis, due to Bedsores and Cystitis.*—Jacob C., 25 years of age, was admitted April 5, 1902. At this hospital, November 1, 1901, a large, round-celled sarcoma had been removed from his thigh. Two months after this operation a recurrence in the femoral glands was noted. On admission the growth was considered to be inoperable. Nine weeks ago there commenced a pain in the back; one week ago failure of muscular strength in the lower limbs was observed. Difficulty of urination also appeared, necessitating catheterism. Alvine evacuations involuntary. Complete anesthesia of the anterior and posterior surfaces of both lower extremities and of the genitals. Loss of patellar reflexes; motor paralysis of both legs; large bedsore over the sacrum.

Condition became gradually worse. Chills and high fever set in, and patient died on May 7.

No autopsy was permitted.

UNCLASSIFIED CASES. TOTAL, 19; 1 DEATH.

	Total.	Cured.	Improved.	Unimproved.	Died.
Constipation	6	6	..	..	..
Burns	1	..	..	..	1
Syphilis	2	..	1	1	..
Diabetes mellitus	1	..	..	1	..
Malaria	1	1	..	..	..
Plumbism	1	1	..	..	..
Anemia	1	1	..	..	..
Enterocolitis	1	..	1	..	..
Hysteria	1	1	..	..	..
Neurasthenia	1	..	..	1	..
Senility	1	..	..	1	..
Malingering	2	..	..	2	..

The death reported under this heading (1902, page 552) was caused by extensive burns of the body. The patient reached the hospital in a condition of profound shock and died three hours later.

REPORT OF THE DEPARTMENT OF GENERAL SURGERY.

REPORT OF THE SECOND SURGICAL DIVISION.

December 1, 1900, to December 1, 1901.

HOWARD LILIENTHAL, M.D.,
ATTENDING SURGEON.

JOSEPH WIENER, JR., M.D., CHARLES A. ELSBERG, M.D.,
ADJUNCT ATTENDING SURGEONS.

FROM December 1, 1900, to December 1, 1901, the Second Surgical Division treated 529 cases of disease in which 555 operations were performed. Synchronous operations have for the most part been considered as single operations, unless two distinct regions of the body were operated upon at the same sitting. In general, the treatment of wounds has been the same as that of the year preceding. There has been a greater tendency to avoid the use of iodoformized gauze and to use plain sterile gauze instead. As in the past, catgut has been the material in general use for ligatures and buried sutures, silk having been used only for skin sutures. In the majority of the aseptic wounds the skin incisions have been closed with sterile zinc plaster strips—a method by which stitch abscesses can be absolutely avoided. The resulting scars are usually ideal.

During the past year cotton gloves have been employed to a very limited extent. Rubber gloves have usually been worn. It has become a rule that the assistants and nurses at every operation must wear sterile rubber gloves. It must be recognized that one of the safeguards in aseptic surgery is the keeping of the hands as clean as possible between clean operations.

A study of the mortality of the cases operated upon will show the reader that in most of the fatal ones the outcome was due to the desperate condition in which the patients were brought to the hospital. As was observed in the report of the preceding year, it has been the routine practice to give every patient the chance which an operation afforded him when the conditions were otherwise hopeless. This has undoubtedly raised the percentage of operative mortality.

DISEASES TREATED IN THE SECOND SURGICAL DIVISION.

TOTAL—529.

	Operation.	No operation.	Cured.	Improved.	Unimproved.	No treatment.	Died.	Totals.
Cranium—6.								
Trigeminal neuralgia	1	..	1	..	..	..	..	1
Fracture of base	..	1	1	..	..	..	..	1
Infected hematoma of scalp	1	..	1	..	..	..	..	1
Burns of scalp	1	..	1	..	..	..	..	1
Contusion of head	..	2	2	..	..	..	..	2
Face and Mouth—18.								
Lip—6.								
Lacerated wound of	1	1	2	..	..	..	..	2
Harelip	1	..	1	..	..	..	..	1
" and cleft palate	1	2	1	..	2	..	..	3
Nose—3.								
Fracture of	..	1	1	..	..	..	..	1
Necrosis of nasal bones	1	..	1	..	..	..	..	1
Deformity of	1	..	1	..	..	..	..	1
Superior Maxilla—4.								
Recurrent fibroma of	1	..	1	..	..	..	..	1
Burn of cheeks	..	1	1	..	..	..	..	1
Cicatricial deformity of face	1	..	1	..	..	..	..	1
Necrosis of hard palate	1	..	1	..	..	..	..	1
Inferior Maxilla—5.								
Osteomyelitis of	2	..	1	..	..	..	1	2
Necrosis of	1	..	1	..	..	..	..	1
Sarcoma of	1	..	1	..	..	..	..	1
Periostitis of	1	..	1	..	..	..	..	1
Neck—13.								
Tumor of parotid	1	..	1	..	..	..	..	1
Abscess of neck	1	..	1	..	..	..	..	1
Adenitis of	1	1	1	..	..	..	1	2
" " tuberculous	6	..	6	..	..	..	..	6
Torticollis	1	..	..	..	1	..	..	1
Lymphangioma of	1	..	1	..	..	..	..	1
Congenital fistula of	1	..	1	..	..	..	..	1
Pharynx—7.								
Peritonsillar abscess	1	..	1	..	..	..	..	1
Retropharyngeal abscess	3	1	3	..	..	..	1	4
Sarcoma of	1	..	..	1	..	..	..	1
Tertiary syphilis of	..	1	..	1	..	..	..	1

	Operation.	No operation.	Cured.	Improved.	Unimproved.	No treatment.	Died.	Totals.
Upper Extremities—17.								
Axilla—4.								
Abscess of	2	..	2	..	..	..	..	2
Gunshot wound of	1	..	1	..	..	..	..	1
Congenital cyst of	1	..	1	..	..	..	..	1
Arm—4.								
Burns of	1	1	1	..	1	..	..	2
Humerus, fracture of	1	..	1	..	..	..	..	1
" necrosis of	1	..	..	1	..	..	..	1
Forearm—4.								
Sarcoma of	1	..	1	..	..	..	..	1
Radius, osteomyelitis of	1	..	..	1	..	..	..	1
Elbow, tuberculous arthritis of	1	..	1	..	..	..	..	1
" contusion of	1	..	1	..	..	..	..	1
Hand—5.								
Cellulitis of	4	..	3	1	..	..	..	4
Gangrene of	1	..	1	..	..	..	..	1
Thorax—14.								
Fracture of spinous process of vertebra	1	..	1	..	..	..	..	1
Empyema of	3	..	1	1	..	..	1	3
Pyopneumothorax	1	..	..	..	..	..	1	1
Bronchiectases	1	..	..	..	..	..	1	1
Fracture of ribs; pyopneumothorax	1	..	..	..	1	..	..	1
Necrosis of rib	3	..	2	..	..	..	1	3
Sarcoma " "	1	..	..	1	..	..	..	1
Contusion of thorax	..	2	..	..	..	..	..	2
Intercostal neuralgia	..	1	..	..	..	..	..	1
Back—5.								
Lipoma of	1	..	1	..	..	..	..	1
Abscess of	3	..	3	..	..	..	..	3
Lumbar abscess	1	..	..	1	..	..	..	1
Lumbo-Sacral Region—9.								
Gumma of sacral region	1	..	1	..	..	..	..	1
Dermoid " " "	2	..	2	..	..	..	..	2
Sacrococcygeal cyst	1	..	1	..	..	..	..	1
Osteomyelitis of coccyx	1	..	1	..	..	..	..	1
Abscess of buttock	1	..	1	..	..	..	..	1
Lipoma " "	1	..	1	..	..	..	..	1
Sarcoma " "	1	..	1	..	..	..	..	1
Psoas abscess	1	..	..	..	1	..	..	1
Breast—15.								
Abscess of	5	..	5	..	..	..	..	5
Intracanalicular fibroma of	1	..	1	..	..	..	..	1
Fibroma of	2	..	2	..	..	..	..	2
Adenoma of	1	..	1	..	..	..	..	1
Carcinoma of	5	..	4	1	..	..	..	5
" " recurrent	1	..	..	1	..	..	..	1

	Operation.	No operation.	Cured.	Improved.	Unimproved.	No treatment.	Died.	Totals.
Abdominal Wall—1.								
Lipoma of	1	..	1	..	..	..	..	1
Stomach and Esophagus—14.								
Acute toxic esophagitis	1	..	..	..	..	..	1	1
Carcinoma of esophagus	1	1	..	1	..	1	..	2
Foreign body in "	1	..	1	..	..	..	..	1
Gastroduodenitis	..	1	..	1	..	..	..	1
Gastric ulcer	..	1	1	..	..	..	..	1
Benign stenosis of pylorus	2	..	1	..	..	..	1	2
Carcinoma of stomach	5	..	..	2	..	..	3	5
" " " and pancreas	1	..	..	..	..	..	1	1
General Abdominal Cavity—164.								
Liver—11.								
Cyst of	1	..	1	..	..	..	..	1
Abscess of	6	..	3	..	..	..	3	6
Multiple abscesses of	1	..	..	..	..	..	1	1
Carcinoma of	1	..	..	..	..	..	1	1
Subphrenic abscess	2	..	1	..	..	..	1	2
Gall Bladder and Ducts—21.								
Pericholecystitis	1	..	1	..	..	..	..	1
Cholecystitis	4	6	7	..	2	1	..	10
Cholelithiasis	8	1	7	..	1	..	1	9
Empyema of gall bladder	1	..	1	..	..	..	..	1
Intestines—18.								
Carcinoma of colon and bladder	1	..	..	..	..	..	1	1
" " " intestinal obstruction	4	..	3	..	..	..	1	4
Intestinal obstruction following appendicitis	2	..	..	..	..	..	2	2
Acute intussusception	3	..	3	..	..	..	..	3
Chronic "	1	..	1	..	..	..	..	1
" intestinal obstruction	2	..	2	..	..	..	..	2
Colitis	..	1	1	..	..	..	..	1
" papillomatous	1	..	1	..	..	..	..	1
Enteroptosis	..	1	..	..	1	..	..	1
Constipation	..	1	..	1	..	..	..	1
Intestinal toxemia	..	1	1	..	..	..	..	1
Other Abdominal Diseases—114.								
Appendicitis, acute catarrhal	13	1	14	..	..	..	..	14
" " " pyosalpinx	1	..	1	..	..	..	..	1
" " ulcerative	5	..	5	..	..	..	..	5
" " abscess	12	..	12	..	..	..	..	12
" " " perforation of gut	1	..	..	..	..	..	1	1
" " gangrenous	33	..	32	..	..	..	1	33
" " " diffuse peritonitis	8	..	8	..	..	..	..	8
" " " general "	3	..	..	..	..	..	3	3
" " " multiple abscesses	1	..	..	..	..	..	1	1

Other Abdominal Diseases—Continued.	Operation.	No operation.	Cured.	Improved.	Unimproved.	No treatment.	Died.	Totals.
Appendicitis, acute perforating	9	..	8	..	..	..	1	9
" " " general peritonitis	1	..	..	..	..	..	1	1
" empyema of appendix	2	..	2	..	..	..	..	2
" chronic catarrhal	18	..	17	..	..	..	1	18
" " " inguinal hernia	1	..	1	..	..	..	..	1
Omentum, intra-abdominal torsion of	1	..	1	..	..	..	..	1
General purulent peritonitis	1	1	..	..	..	..	2	2
Tuberculous peritonitis	2	..	1	1	..	..	..	2
Herniæ—50.								
Inguinal, indirect, reducible	16	1	16	..	1	..	..	17
" " " double	10	..	10	..	..	..	..	10
" congenital, undescended testicle, double	1	..	1	..	..	..	..	1
" reducible, hydrocele	1	..	1	..	..	..	..	1
" irreducible	1	..	1	..	..	..	..	1
" congenital	2	..	2	..	..	..	..	2
" strangulated	4	..	2	..	..	..	2	4
" " gangrene of gut	1	..	1	..	..	..	..	1
" direct	1	..	1	..	..	..	..	1
Femoral, reducible	2	..	2	..	..	..	..	2
" strangulated	3	..	2	..	..	..	1	3
Umbilical, "	1	..	1	..	..	..	..	1
Ventral	2	1	1	..	1	..	1	3
" double	1	..	1	..	..	..	..	1
Strangulated internal (Fossa Treitz)	1	..	..	..	..	..	1	1
Congenital perineal	1	..	..	..	..	..	1	1
Genitourinary Diseases—62.								
Kidney—18.								
Movable	2	1	2	..	1	..	..	3
Calculus of, pyelonephritis	..	1	1	..	..	..	..	1
Pyelitis	2	..	2	..	..	..	..	2
Pyelonephritis	5	..	3	..	..	..	2	5
Acute nephritis	1	..	..	..	..	..	1	1
Chronic "	1	..	..	1	..	..	..	1
Septic " with miliary abscesses	1	..	1	..	..	..	..	1
Congenital hydronephrosis	1	..	1	..	..	..	..	1
Tuberculosis of	2	..	2	..	..	..	..	2
Sarcoma of	1	..	..	..	..	..	1	1
Bladder—2.								
Calculi of	1	..	1	..	..	..	..	1
Chronic cystitis	1	..	..	1	..	..	..	1
Prostate—13.								
Abscess of	2	..	2	..	..	..	..	2
Inflammation of	..	1	..	1	..	..	..	1
Hypertrophy of	8	2	7	2	..	..	1	10
Seminal Vesicles—2.								
Inflammation of	..	2	..	2	..	..	..	2

	Operation	No operation	Cured	Improved	Unimproved	No treatment	Died	Totals
Penis and Urethra—13.								
Urethra, gonorrheal inflammation of	..	1	1	..	..	..	..	1
" stricture of	7	..	7	..	..	..	..	7
Periurethral abscess	2	..	2	..	..	..	..	2
Urethral fistula	1	..	1	..	..	..	..	1
Hypospadias	2	..	1	1	..	..	..	2
Testicle and Scrotum—14.								
Scrotum, gangrene of	1	..	1	..	..	..	..	1
Epididymitis and orchitis	1	1	2	..	..	..	..	2
Orchitis, syphilitic	1	..	1	..	..	..	..	1
Hydrocele	3	..	3	..	..	..	..	3
Varicocele	5	..	5	..	..	..	..	5
Testis, hematoma of	1	..	1	..	..	..	..	1
" tuberculosis of	1	..	1	..	..	..	..	1
Rectum and Anus—53.								
Hemorrhoids	24	..	24	..	..	..	..	24
Ischiorectal abscess	8	..	8	..	..	..	..	8
Rectum, carcinoma of	2	4	1	..	4	..	1	6
" prolapse of	..	1	..	1	..	..	..	1
" polyp of	1	..	1	..	..	..	..	1
Anus, fissure of	2	1	1	2	..	..	..	3
" fistula of	10	..	10	..	..	..	..	10
Lower Extremities—63.								
Pelvis—5								
Pelvic adenitis	..	1	..	..	1	..	..	1
Groin, abscess of	1	..	1	..	..	..	..	1
" adenitis of	2	..	2	..	..	..	..	2
" sarcoma of	1	..	..	..	1	..	..	1
Hip—2.								
Tuberculosis of	1	..	1	..	..	..	..	1
Periarticular abscess of	1	..	1	..	..	..	..	1
Thigh—21.								
Abscess of	4	..	3	..	..	..	1	4
Cellulitis of	1	..	1	..	..	..	..	1
Femoral aneurism, mycotic	1	..	..	..	..	..	1	1
Femur, intracapsular fracture of	..	1	1	..	..	..	..	1
" fracture of shaft	1	6	5	..	2	..	..	7
" osteomyelitis of, acute	2	1	1	..	..	..	2	3
" " " chronic	2	..	2	..	..	..	..	2
" osteosarcoma of	2	..	2	..	..	..	..	2
Patella—3.								
Suppurative prepatellar bursitis	1	..	1	..	..	..	..	1
Fracture of	2	..	2	..	..	..	..	2
Knee—4.								
Tuberculous arthritis of	3	1	1	2	..	..	1	4

	Operation.	No operation.	Cured.	Improved.	Unimproved.	No treatment.	Died.	Totals.
Leg—10.								
Contusion of	..	1	1	..	..	..	..	1
Erysipelas of	..	1	1	..	..	..	..	1
Neuroma of	1	..	1	..	..	..	..	1
Burns of	1	..	1	..	..	..	..	1
Varicose veins of	2	1	2	1	..	..	..	3
Tenosynovitis of	1	..	1	..	..	..	..	1
Genu valgum	1	..	1	..	..	..	..	1
Tibia, osteomyelitis of	6	1	6	..	..	..	1	1
Ankle—4.								
Sprain of	..	1	1	..	..	..	..	1
Arthritis, suppurative	1	..	..	..	..	..	1	1
" tuberculous	2	..	..	2	..	..	..	2
Foot—14.								
Pes planus	..	1	..	1	..	..	..	1
Gangrene of, Reynaud's disease	1	..	1	..	..	..	..	1
" " senile	2	1	1	..	1	..	1	3
" " diabetic	3	..	1	1	..	..	1	3
Gonorrheal rheumatism of	1	..	1	..	..	..	..	1
Dislocation of tarsus	..	1	1	..	..	..	..	1
Gangrene of toe, traumatic	1	..	1	..	..	..	..	1
Deformity " "	1	..	1	..	..	..	..	1
Lacerated wound of toe	..	1	1	..	..	..	..	1
Ingrowing toenail	1	..	1	..	..	..	..	1
Miscellaneous—18.								
Pyemia	2	..	2	..	..	..	..	2
Endometritis	2	..	2	..	..	..	..	2
Retroflexion of uterus	..	1	..	1	..	..	..	1
Fibroid " "	1	..	..	..	..	..	1	1
Double pyosalpinx	1	..	1	..	..	..	..	1
Ovarian cyst; twisted pedicle	1	..	1	..	..	..	..	1
Hysteria	..	1	..	1	..	..	..	1
Muscular rheumatism	..	1	1	..	..	..	..	1
Epistaxis	..	1	1	..	..	..	..	1
Pneumonia	..	1	..	..	..	1	..	1
Malingering	..	1	..	..	..	1	..	1
Fecal impaction	..	1	1	..	..	..	..	1
Tumor of pelvis	..	1	..	..	1	..	..	1
Sarcomatosis	..	2	..	..	..	..	2	2
Septic neuritis	..	1	..	..	1	..	..	1

REPORT OF DISEASES TREATED IN THE SECOND SURGICAL DIVISION.

OPERATIONS, 555; DEATHS, 58.

OPERATIONS UPON THE FACE, ORAL CAVITY, AND JAWS. TOTAL, 20; 2 DEATHS.

	Totals.	Deaths.
Incision and drainage for cellulitis of face	1	..
" " " " abscess of jaw	2	..
" " " " " " nose	1	..
" " " " " " antrum	1	..
" " " " infected hematoma of scalp	1	1
Uranoplasty and staphylorrhaphy	1	..
Secondary operation for harelip and cleft palate	1	..
Cheiloplasty for harelip	2	..
Removal of sutures after uranoplasty	1	..
Heteroplasty on nose	1	..
Osteotomy for osteomyelitis of lower jaw	5	1
Excision of fibroma of superior maxilla	1	..
Resection of inferior maxilla for sarcoma	1	..
" " " " " epulis	1	..

In the case of cleft palate the fissure was a very wide one and it required several operations to close it. The rapid improvement in the child's speech is noteworthy.

The insertion of a celluloid plate into the subcutaneous tissues of the bridge of the nose was done for esthetic purposes. The plate was introduced through an incision in the septum and remained in place without causing any symptoms of local irritation.

Harelip and Cleft Palate; Uranoplasty and Staphylorrhaphy; Cure.—Henry L., 6 years old, was admitted January 1, 1901, with complete congenital cleft palate with a very wide fissure, and harelip. The defect involved the entire soft and hard palates, and there was both harelip and a marked deformity of the intermaxillary bones. On January 12 operation with the dependent head. Chloroform. Whitehead's gag. Mucoperiosteal flaps with generous relaxing incisions parallel with the line of the teeth; the hamular processes fractured with the chisel. Approximation of uranoplastic wound by means of silver plates and silk, the staphylorrhaphy with silk previously dipped in compound tincture of benzoin. Rectal alimentation for three days. On January 2, ten days after the operation, the sutures were removed from the hard and soft palates; the wounds in the soft and the greater part of the hard palate were firmly united. On February 23 the intermaxillary bones were fractured and pushed backward so that the incisor teeth were in a line with the canines, and were fixed in place by sutures. The harelip was then closed by

the Nélaton method. The wounds healed well, but the patient was kept in the hospital for several months for observation. When the boy was discharged on June 28, a very small triangular defect remained between the intermaxillary bones and the hard palate. During the last two months of the patient's stay in the hospital a marked improvement in his speech was noted.

Saddlenose; Heteroplasty; Cure.—A. D., 35 years old, was admitted and operated upon April 29, 1901. A small antero-posterior incision was made in the nasal septum, the skin over the bridge of the nose freed from the deeper tissues, and a small celluloid plate inserted, the depressed skin being raised thereby. The small wound was closed by one suture. Convalescence was uninterrupted, and when the patient was discharged the celluloid plate was firmly healed in its place. There was marked improvement in the patient's appearance.

Osteomyelitis of the Inferior Maxilla; Septicemia; Operation; Death.—F. S., female, 4 years old, was admitted to the hospital on April 8 in very poor condition. Six weeks after an attack of measles the patient developed a painful swelling on the left side of the lower jaw, with high temperature and marked prostration. Several teeth were drawn and an alveolar abscess incised from the mouth. The following day the child developed signs of intestinal obstruction with vomiting and bloody stools. Exploratory laparotomy was done, but nothing could be found to explain the symptoms. Death occurred on April 10 with all the signs of septicemia. No autopsy.

Retropharyngeal Abscess; Pneumonia; Death.—I. K., male, 14 months old, was admitted on March 10, 1901, with severe dyspnea and cyanosis from a large retropharyngeal abscess. The abscess was incised and drained from the side of the neck, tracheotomy was done later, but the child died from pneumonia on the following day.

Marasmus; Stomatitis; Submaxillary Adenitis; No Operation; Death.—Theresa G., 3 months old, was admitted August 28, 1901, in a very emaciated condition, with an aphthous stomatitis and a submaxillary adenitis. Death occurred without operation on August 31.

Lacerated Wounds of the Mouth; Incision and Drainage; Cure.—Samuel W., 6 years old, was injured fifteen hours before admission on July 5, 1901, by the explosion of a large torpedo which he was holding between his teeth. The boy's entire face and tongue were much swollen, there were a number of irregularly lacerated wounds in the mucous membrane of his mouth, a large wound in which was exposed part of the ramus of the lower jaw on the right side, and another wound in the mouth in which was exposed the facial surface of the superior maxilla over an area of two inches. All the wounds

looked necrotic and contained particles of paper and stone. Under free incision and drainage the swelling quickly subsided, so that the patient was discharged cured on July 27.

OPERATIONS ON THE NECK. TOTAL, 18; 2 DEATHS.

	Totals.	Deaths.
Excision of cervical glands	4	..
" " submaxillary and axillary glands	1	..
" " congenital cyst of neck	2	..
" " sarcoma of parotid gland	1	..
Incision and drainage for suppurative adenitis	3	1
" " " " abscess of neck	2	..
" " " " retropharyngeal abscess	3	1
Exploratory incision for torticollis	1	..
Tonsillotomy and removal of adenoids	1	..

The history of a case of congenital cyst, which could not be radically extirpated on account of its close connections with the large vessels of the neck, follows. The unusual feature of the case is the healing that occurred after simple incision and curettage.

Lymphangioma Congenita Colli; Extirpation; Cure.—Katie O., 7 years of age, was admitted May 13, 1901, with a large cystic swelling in the right cervical region. The swelling had existed since birth, and in spite of several operations had steadily increased in size. May 25: Chloroform anesthesia; vertical incision over tumor, which was found to be a multilocular cyst intimately connected with the large vessels of the neck. It was incised and drained. June 8: Nitrous oxide and ether; considerable of the cyst wall which had become necrotic was removed, and the large cavity thoroughly curetted and drained. Convalescence was uneventful; the wound healed slowly by granulation; the patient was discharged cured on August 10.

In the removal of tumors of the parotid gland great care has to be taken not to injure any of the branches of the facial nerve. If possible the incision should be carried along the border line between the ear and the cheek, and the scar thus made in the least noticeable position. In the following case the result was a satisfactory one, although one of the branches of the facial nerve, which entered the tumor, had to be divided.

Fibro-myxo-chondroma of the Parotid; Excision; Cure.—I. G., a man 50 years of age, was admitted on August 6, 1901, with a tumor of the size of a goose egg in the parotid region. The tumor had appeared about nine years ago and had been slowly increasing in size. August 10, under ether, a vertical incision was made in front of the ear. The tumor was found to be well encapsulated; it was carefully freed from its attachments, the branches of the facial nerve which were

encountered being carefully pulled aside and one branch which entered the mass being divided. The growth was found to extend downward and inward to the carotid artery and the styloid process, so that it required considerable dissection to free its lowermost portion. The wound was closed with interrupted silk sutures, a small drain having been inserted in its most dependent portion. Primary union occurred, and only a slight paralysis of one of the lower branches of the facial nerve remained when the patient was discharged cured on August 31. The pathologist reported the tumor a fibro-myxo-chondroma of the parotid gland.

OPERATIONS ON THE WALLS OF THE THORAX AND THE THORACIC CONTENTS.

OPERATIONS, 18; 4 DEATHS.

	Totals.	Deaths.
Incision and drainage of abscess of rib	1	..
Resection of ribs for osteomyelitis	2	..
" " " " necrosis	1	1
" " " " cystosarcoma	1	..
" " " " empyema	3	..
" " " " " Délorme's operation	1	1
" " " " pyopneumothorax	1	1
" " " preliminary to pneumonotomy	1	1
Thoracoplasty for sinus after empyema	3	..
" (Schede) for sinus after empyema	1	..
Resection of sternum for sinuses	1	..
Paracentesis of pericardium	1	..
Excision of congenital cyst of chest wall	1	..

The following is the history of a rare form of chronic pleurisy which became an empyema, in which the fluid contained an enormous quantity of cholesterin. The unfortunate ending of the case could hardly have been avoided, as there was no hope of curing the patient except by the removal of the calcareous plates which had been formed on the surface of the pleuræ. The wound in the diaphragm was originally a very small one and ordinarily a gauze packing would have sufficed to close it. On account of the calcareous deposits on the diaphragmatic pleura, it was impossible to close the opening by suture.

Cholesterin Pleurisy; Empyema; Pulmonary Decortication (Délorme); Death.—Thomas G., 32 years old, was admitted to the medical service of Dr. Manges on April 18, 1901 (see medical histories). The left chest was filled with fluid which contained a large amount of cholesterin. Under observation, the fluid gradually changed its character—the large amount of cholesterin persisted, but the fluid became very offensive and took on the character of thin pus. Soon afterward the patient began to cough up a similar fluid, a perforation into the lung having occurred. The patient was transferred to the surgical service and operated upon on July 5. A skin and bone flap, consisting of portions of the seventh to tenth ribs and the soft tissues

over them, was turned up, the pleural cavity opened, and about 1,000 c.c. of foul fluid evacuated. The parietal and visceral pleuræ were very thick and calcareous in spots. A considerable quantity of the thick tissue was peeled off the lung and the diaphragm, a small opening in the latter being packed with gauze. The pleural cavity was irrigated with hot salt solution, a Mikulicz drain inserted, the bone flap turned back into place, and a dry dressing applied. The patient reacted poorly after the operation. After a few hours the bandages had to be changed on account of considerable oozing of blood, and because the patient's condition was very poor. A large rupture of the diaphragm was found to have occurred, through which the spleen, the stomach, and a large part of the intestine had prolapsed. These were replaced with considerable difficulty, the opening in the diaphragm being tightly packed with gauze. In spite of infusion and energetic stimulation, the patient's condition did not improve and he died a few hours later.

Pyopneumothorax; Thoracotomy; Death.—Samuel B., 75 years old, was admitted in very poor condition with a right pyopneumothorax, and operated upon February 3, 1901. Under 2 per cent. eucaine anesthesia the eighth rib was resected and the right chest drained. The patient's condition improved somewhat after the operation, but he suddenly died in collapse twelve hours later. No postmortem examination was permitted.

Tuberculous Osteomyelitis of Rib; Resection; Tuberculous Meningitis; Death.—Rosie D., 33 years old, was admitted June 4, 1901, with the history that she had had a painful swelling in her left side for the past three weeks. The swelling was over the eighth left chondrocostal articulation; it was fluctuating and very tender, but the skin over it was normal. A loose piece of bone could be felt under the skin. June 27: Nitrous oxide and ether; tumor incised; several ounces of thick pus evacuated; some pieces of necrotic rib removed. Soon after the operation the patient began to complain of headache and the temperature became very variable. A blood culture was negative; the sputum did not contain tubercle bacilli. The patient gradually became somnolent, the somnolence gave place to deep coma, in which she died on July 11. No postmortem examination was permitted.

The difficulties that are met with in pulmonary surgery are well exemplified in the following history. The absence of numerous and firm adhesions between the visceral and parietal pleuræ contributed considerably to the post-operative shock and certainly rendered more difficult the search for the bronchiectatic cavity. Furthermore, the case demonstrates how difficult it may be to find such a cavity after it has been emptied of its contents, even though it has been correctly

located before the operation. The relief of the dyspnea and cyanosis by aspiration of the air from the pleural cavity is interesting. The very poor condition of the patient before the operation contributed essentially to the fatal outcome.

Bronchiectasis; Thoracotomy Preliminary to Pneumonotomy; Death.—Meyer G., 20 years old, was admitted to the medical service of Dr. Rudisch on October 17, 1901. The patient was transferred to the surgical service and operated upon on November 16 for a bronchiectatic cavity in the lower lobe of the right lung. Under nitrous oxide and ether anesthesia two inches of the ninth and tenth ribs were resected in the axillary line and the pleural cavity opened. There were some adhesions between the visceral and parietal pleuræ, so that the lung only partially collapsed. The attempt to unite the two pleural layers by suture was unsuccessful and the pleural cavity was walled off in all directions with gauze. Aspiration of the lung gave no result, nor did palpation reveal any difference in consistence in any part of the lung. It was determined to wait until firm adhesions had formed, so the opening in the thorax was packed with gauze and the patient sent back to bed. November 16: First dressing: the packings were partially removed and the lung aspirated in several directions, but the cavity could not be located. As the patient had considerable dyspnea from the pneumothorax which persisted, the pleural cavity was aspirated and considerable air withdrawn. The dyspnea was much relieved. The patient's condition, which had been very poor before the first operation and which had not improved, did not permit of any further exploration. The pulse remained rapid and feeble, and the temperature remained high. Death occurred from exhaustion on November 29. At the postmortem examination (pathological report No. 801) the bronchiectasis was found deeply situated in the lung and empty.

A case of sarcomatosis is next reported which demonstrates what may follow the removal of a pigmented mole from any part of the body. Although the connection between pigmented moles and melanosarcomata is not yet understood, a sufficient number of such cases have already been reported to make every physician hesitate before recommending the removal of such a small growth. If a pigmented mole is removed the entire incision should be made in the healthy tissues at some distance from the involved area.

Melanosarcoma of Back; Sarcomatosis; Death from Exhaustion.—William O., 23 years old, was admitted June 22, 1901. Seven months before admission a small tumor was removed from the patient's back (pigmented mole?). One month later a non-painful enlargement of the glands in the right axilla appeared, which was incised by his

physician and some of the glands removed. The wound in the axilla never healed. For the past three months the patient had been losing flesh and strength, and for the past two weeks had some pain in the abdomen. On admission the physical examination showed the following: A much-emaciated man; glands in both axillæ enlarged; in the right axilla an open wound discharging pus, in the depth of which a pigmented tumor was to be seen. The liver was enlarged and extended one hand's breadth below the free costal margin; the spleen was enlarged to percussion and palpation. There was a small pigmented tumor near the spine of the eleventh dorsal vertebra. The abdomen contained considerable fluid. The patient steadily became weaker until death occurred from exhaustion on June 27. No post-mortem was permitted, but the glands that had been removed from the right axilla were obtained from the relatives and sent to the pathologist, who reported melanosarcoma.

Congenital Cyst of Chest Wall; Extirpation; Cure.—Rosie B., 25 years old, was admitted March 27, 1901, with a large cystic tumor in the left chest wall which she had had since birth. After the patient's last confinement, four months ago, the tumor rapidly increased in size. March 30, nitrous oxide and ether narcosis. The cyst was incised and the entire cyst wall extirpated. The cyst was firmly adherent to the serratus magnus and latissimus dorsi muscles, and extended into the intercostal muscles. The cystic fluid was light green, transparent, and of a honey-like consistence. It coagulated within five minutes after its removal. The wound was closed with zinc straps; primary union was perfect.

The value of Schede's operation is well shown by the following case. The patients on whom an extensive resection of the chest wall has been done usually suffer severely from shock during the first twenty-four hours after the operation. This is due both to the large wound and to the loss of blood, which is often considerable. It is our custom, therefore, to stimulate these patients freely for several days before the operation, and we have found that strophanthus is one of the most valuable drugs for this purpose.

Subphrenic Abscess; Transpleural Incision and Drainage; Empyema; Drainage of Pleural Cavity; Sinus after Empyema; Thoracoplasty (Schede); Cure.—Nathan S., 23 years of age, was transferred from the medical service of Dr. Rudisch and operated upon August 10, 1900. Three weeks before, the patient had pain in the right side of the abdomen and in the hepatic region, with fever; no cough or expectoration. The pain in the lower part of the abdomen disappeared in a few days, while the pain in the region of the liver became more severe. When he was admitted to the medical side the liver was somewhat enlarged, there was some dulness with diminished voice,

breathing, and fremitus at the base of the right lung. July 30: Tenderness on percussion and palpation in the axillary line over the area of liver dulness; aspiration negative; temperatures fluctuating between 100° and 104°; pulse 76-98. August 4: Slight jaundice; tenderness in axilla much increased; aspiration negative. August 6: Aspiration again negative; no "Litten" phenomenon; area of dulness over lower part of right lung extended upward; temperatures fluctuating as before. August 9: Aspiration in the axillary line through the eighth interspace gave pus; on microscopical examination no liver elements. August 10: Three inches of ninth and tenth ribs resected in axillary line; pleura incised; diaphragmatic sewn to costal pleura and protected with gauze; diaphragm incised and large quantity of foul pus evacuated; drainage. The patient stood the operation well, but his convalescence was delayed by a secondary empyema, which was drained through the original pleural incision. October 4: Subphrenic wound entirely healed; continual profuse discharge from pleural sinus, which is fully six inches long and ends in a cavity which holds about five ounces of fluid. November 6: Thoracoplasty; Schede operation with atypical incision; portions of eight ribs resected and large cavity exposed and packed. Convalescence slow but uninterrupted. The large wound healed slowly by granulation; the cavity contracted rapidly. The wound was entirely closed and the patient was discharged cured on January 9, 1901.

Whenever possible, preference has been given, in operating posteriorly or laterally for liver abscess or subphrenic abscess, to the method of dissection by pushing the pleura up out of the way, thus avoiding a pleural opening with the danger of secondary empyema.

OPERATIONS ON THE BREAST AND THE ABDOMINAL WALL.

OPERATIONS, 21; NO DEATHS.

	Totals.
Incision and drainage of abscess of breast	4
" " " " diffuse chronic suppurative mastitis	1
Amputation of breast for carcinoma	4
" " " " cystosarcoma	1
Extirpation of fibroma	2
" " cystadenoma	1
" " recurrent carcinoma	2
Excision of lipoma of abdominal wall	1
Secondary suture of abdominal wall	3
Revision of laparotomy wound	2

APPENDICITIS. TOTAL, 108; DEATHS, 9.

I. *Celiotomy; excision of appendix; closure of wound.*

	Totals.
Celiotomy for acute or subacute non-perforative appendicitis	10
" " chronic appendicitis	16
" " empyema of appendix	1
" following incision and drainage for acute appendicitis	1

II. *Celiotomy; acute appendicitis; circumscribed or diffuse peritonitis.*

Appendix removed:	Totals.	Deaths.
For acute catarrhal appendicitis	2	..
" " " " pyosalpinx	1	..
" " ulcerative "	5	..
" " appendicitis, abscess	6	..
" " " " perforation of bowel	1	1
" " gangrenous appendicitis with abscess	33	1
" " " " diffuse peritonitis	8	..
" " " " general "	3	3
" " " " multiple abscesses	1	1
" " perforative appendicitis	9	1
" " " " general peritonitis	1	1
" empyema of appendix	1	..
" chronic catarrhal appendicitis	2	1
" " " " inguinal hernia	1	..
Appendix not removed:		
In abscess, peritoneal drainage	6	..

One hundred and eight operations for appendicitis were performed, not including operations for the relief of complications, and there were nine deaths. In addition, the appendix was removed when it appeared in the wound during the course of certain operations done for other diseases. Thus the appendix was removed several times when it formed part of the contents of an inguinal hernia, it was removed twice in the course of an operation for intussusception, and once in the course of the closure of a right inguinal colostomy wound. Of the nine deaths that occurred in operations for appendicitis, five were in patients who had general peritonitis at the time of operation, and three others in patients with gangrene or perforation of the appendix. In the cases with an abscess, cultures were generally taken from the pus. In the greater number of the cases the pus contained the bacillus coli communis; some of the cultures were negative, although organisms were found in spreads from the pus. Among the rare organisms found might be mentioned the proteus vulgaris—the patient recovered; and the bacillus pyocyaneus, in which case the disease ended fatally.

There has been little change in the operative methods during the past year; the tendency has been to still further lessen the number of gauze packings left in the wound—drainage of the abscess cavity or the portion of the right iliac fossa in which the appendix lay being generally considered sufficient. As a result it has been possible to close a considerable part of the wound primarily and thus to shorten the time required for healing and the duration of the confinement to bed. It is often surprising that, in a case of an appendix abscess

that is drained, the part of the wound which is closed by suture will heal by primary union, although there is a continual discharge of infectious material over it, and although the suturing was done by hands that have been only superficially washed after the handling of the infectious matter from the appendix and its surroundings. Probably the primary union occurs because there is a free drainage from between the different layers of the abdominal wall into the part of the wound that is left open.

Irrigation of the general peritoneal cavity with solutions of any kind has become a rarity with us, and is only made use of in very far advanced cases of infection of the general peritoneal cavity. In the majority of cases of acute appendicitis with diffuse peritonitis it is impossible to determine how much of the peritoneal cavity is affected, as it is always inadvisable to explore the general cavity in these patients. Therefore we have made use of the term "diffuse peritonitis" to indicate that a considerable portion of the peritoneal cavity was affected, with no "walling off," although how much could not be determined. The only cases in which we were certain that the entire cavity was affected were those in which there was a fatal outcome and the postmortem examination showed that the process was a general one, and these cases we have called "general peritonitis."

In the following pages are given synopses of two very severe cases of gangrenous appendicitis with diffuse purulent peritonitis in which, contrary to all expectation, the patients recovered, and also brief reports of *all* the cases with a fatal outcome.

Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Appendicectomy and Drainage; Secondary Abscesses in the Left Iliac Region and the Pelvic Cavity; Incision and Drainage; Cure.—Jenny G., 7 years old, admitted and operated upon March 12, 1901. Typical history of appendicitis of two days' duration. Abdomen uniformly distended and tender; liver and spleen enlarged; large, tender tumor in the right iliac region; large, tender mass in the pelvis felt by rectal examination. At the operation the peritoneal cavity was found to contain thin pus. A gangrenous appendix which lay in a large abscess in the right iliac fossa was removed, a pelvic abscess opened, the pelvic and the general peritoneal cavities drained. For a number of days the child's condition was very critical; the pulse remained rapid, the temperature high, and she looked thoroughly septic. Improvement then began, the pulse and temperature became lower, and her appearance was better. The temperature, however, never reached the normal. On March 23 a large abscess in the pouch of Douglas was opened by rectum; on March 26 a large abscess in the left iliac

fossa was incised. The wound on the left side was found to communicate with the rectum, so that feces escaped from the wound. After the third operation the temperature gradually fell to the normal, so that convalescence was well established one week later. She was discharged cured on May 18. Cultures from the fluid in the general peritoneal cavity gave a pure growth of the bacillus coli communis.

Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Appendicectomy and Drainage; Cure.—Bernard L., 7 years old, admitted July 13, 1901. The child's illness had begun four days before his admission, with cramps in the right iliac region accompanied by vomiting and constipation. The pain had become less severe until the day of admission. The abdomen was tympanitic and somewhat tense; the liver dulness was almost entirely obliterated; there was dulness on percussion in both flanks. A large, tender tumor occupied the right iliac fossa. July 13: Operation. On opening the abdomen a large quantity of malodorous pus escaped from the free cavity. The peritoneal surface of the intestines was congested and covered with flakes of fibrin. The appendix, with its tip gangrenous, was found in an abscess cavity high up under the right lobe of the liver. There was practically no ascending colon, and the right iliac fossa was occupied by a loop of the sigmoid flexure. The appendix was removed and the abscess cavity as well as the peritoneal cavity drained. For several days after the operation the patient was in a precarious condition; he then began gradually to improve. Convalescence thereafter was uneventful. He was discharged cured on August 27.

Acute Appendicitis; Multiple Perforations of the Intestine; Incision and Drainage; Death.—Ignatz S., 60 years old, was admitted on June 8, 1901, with a history of pain in the right side of the abdomen, fever, and sweating for the past four weeks. Immediate operation revealed a large abscess cavity containing feces and pus. Several perforations in a coil of small intestine were closed by suture and the cavity drained. A fecal fistula established itself, however, and the patient died of exhaustion and sepsis on June 29. No autopsy.

Acute Gangrenous Appendicitis; Multiple Abscesses; Appendicectomy and Drainage; Death.—Rosie F., 6 years old, was admitted and operated upon on March 5, 1901. Typical history of appendicitis of three days' standing. Large retrocecal abscess opened and gangrenous appendix removed. Large pelvic abscess opened and drained. As the patient's condition did not improve after the operation, the wound was explored and a small abscess found high up under the right lobe of the liver. Death occurred two days later from sepsis. No autopsy.

Acute Gangrenous Appendicitis; General Purulent Peritonitis; Appendicectomy and Drainage; Death.—Therese H., 62 years old, was admitted on October 25, 1901, with a typical history of appendicitis of two days' standing, and signs pointing to an infection of the general peritoneal cavity. A gangrenous appendix situated below the cecum was removed and a large amount of purulent fluid evacuated from the peritoneal cavity. Death occurred on October 27. No autopsy.

Acute Gangrenous Appendicitis; General Peritonitis; Appendicectomy and Drainage; Death.—Minnie S., 55 years old, was admitted and operated upon on August 19, 1901. The history was of four days' standing. Pain and tenderness in the lower part of the abdomen, vomiting and constipation. The peritoneal cavity, opened through a median incision, contained purulent fluid; a gangrenous appendix adherent to the upper part of the sacrum was removed. Death occurred forty-eight hours after the operation. No autopsy.

Acute Gangrenous Appendicitis; Sepsis; Appendicectomy and Drainage; Death.—Nellie A., 11 years old, was admitted and operated upon December 28, 1901. The patient gave a history of appendicitis of three and a half days' duration; there was a large mass in the umbilical and right hypochondriac regions. Temperature 104.2°, pulse 120, respiration 36. At the operation a completely gangrenous appendix adherent to the under surface of the liver was removed and the wound drained. Death occurred twenty-four hours later. No autopsy.

Acute Perforating Appendicitis; General Peritonitis; Appendicectomy and Drainage; Death.—Rachel G., 45 years old, was admitted November 30, 1900. The illness began four days before with general abdominal pains and absolute constipation. Examination showed that the abdomen was much distended and painful over its entire extent; no mass was to be felt. All attempts to move the patient's bowels were unsuccessful, therefore an operation was determined upon and performed on December 1. Ether; median laparotomy. The small intestine was found much distended and several coils were punctured and their contents evacuated. A perforated appendix adherent to the inner side of the colon was found and removed. After the operation the patient's condition did not improve, the abdomen became much distended, and she died with all the symptoms of general peritonitis on December 3. No postmortem examination permitted.

Acute Perforating Appendicitis; Appendicectomy; Death.—Benjamin S., 11 years old, was admitted and operated upon on March 20, 1901, on the third day of a second attack of appendicitis. A retrocecal perforated gangrenous appendix was removed at the operation. Death in five days from sepsis. No postmortem examination.

Acute Perforating Appendicitis; General Peritonitis; Appendicectomy and Drainage; Death.—Harry H. was admitted April 19, 1901, with a typical history of appendicitis of six days' standing. The patient was in very poor condition, and all the signs of infection of the general peritoneal cavity were present. The appendix was entirely gangrenous and the peritoneal cavity contained seropurulent fluid. Death occurred twelve hours after the operation. No autopsy.

Chronic Appendicitis; Appendicectomy and Drainage; Death.—William S. was transferred from the Medical Division on September 21, 1901. The patient had been admitted to the service of Dr. Manges on July 15, 1901. During two months' observation on the medical side the patient had had a number of obscure symptoms, among which pains in the lower limbs, occasional epistaxis, occasional abdominal pains, and rigidity of the right rectus muscle were the most prominent. The patient had lost considerable flesh and strength. For a few weeks before the operation the man complained of frequent pain in the left iliac region. September 21: Operation; exploratory laparotomy; incision along the border of the left rectus muscle. When the abdomen was opened a mass was found on the right side which could not be reached from the left incision. The abdomen was then opened along the outer border of the right rectus. The mass consisted of old and tough adhesions between the bladder, rectum, and several coils of the ileum, in the centre of which lay the appendix. The organ, which was much thickened and congested, was removed, the cavity drained, and the incision on the left side closed. Two days after the operation the patient developed signs of peritonitis, and in spite of energetic treatment he succumbed on September 25. The autopsy showed diffuse peritonitis, chronic nephritis, advanced myocarditis, adhesive pericarditis, pulmonary emphysema.

OPERATIONS ON THE ESOPHAGUS AND STOMACH. OPERATIONS, 11; 6 DEATHS.

	Totals.	Deaths.
External esophagotomy for foreign body	1	..
Exploratory celiotomy for carcinoma of stomach	2	1
Gastrostomy for acute toxic esophagitis	1	1
" " carcinoma of esophagus	2	2
" " " " cardia	1	..
Gastroenterostomy for stenosis of pylorus and dilatation of stomach	1	1
Gastroenterostomy for tumor of pylorus	1	..
" " carcinoma of stomach	1	1
" and enteroenterostomy for stenosis of pylorus	1	..

The following are abstracts of some of the more important operations performed upon the esophagus and the stomach. The high percentage of deaths in the above synopsis is due to a great extent to the fact that a number of patients with malignant disease remained

under observation until death occurred from exhaustion. The large majority of the patients with malignant disease of the stomach that are admitted to this hospital are in such extremely poor condition that little, if anything, can be done for them.

Acute Toxic Esophagitis and Tracheitis; Pneumonia; Gastrostomy; Death.—Koppel S., 44 years old, was admitted January 24, 1901. One and one-half days before admission the patient had accidentally swallowed about one ounce of concentrated sulphuric acid. His mouth had become very sore and he was unable to swallow anything. On examination the mouth and pharynx were found to be one mass of eschars. As the patient was unable to swallow anything, gastrostomy (Kader) was done two days after his admission to the hospital. On the following day double bronchopneumonia set in, to which the patient succumbed on January 28. At the postmortem examination the trachea and esophagus were found to be the seat of an intense inflammation; there was double bronchopneumonia.

Carcinoma of Pancreas and Stomach; Exploratory Laparotomy; Death from Exhaustion.—Nathan K., 52 years old, was admitted October 15, 1901. For the past six months the patient had frequent attacks of pain in the right side of his abdomen, with vomiting. Soon after the beginning of his trouble he noticed that he was becoming yellow; the jaundice had steadily increased up to the time of his admission to the hospital. He had lost much flesh and strength. On examination the patient was found to be in very poor condition; the liver was enlarged and palpable below the free border of the ribs; a globular tumor could be felt to the right of the navel; the abdomen was full of fluid. October 18: Operation; nitrous oxide and ether. Under anesthesia it was found that what had appeared to be free fluid in the abdominal cavity was the enormously dilated and relaxed stomach, which almost filled the entire abdomen and which was filled with fluid. A large tumor was to be felt in the pyloric region of the stomach; the gall bladder was plainly palpable to the right of this tumor. When the abdomen had been opened, after noting the conditions just described, the patient's condition became so poor that further exploration had to be abandoned. So the wound was closed and the patient sent back to bed. He rapidly emaciated, death from exhaustion occurring on November 1. The postmortem examination (pathological number 801) showed carcinoma of the pancreas and neighboring viscera.

Carcinoma of Esophagus; Gastrostomy (Kader); Improvement.—Louis I., 44 years of age, was admitted on October 7, 1901, with a history of five months' duration of slowly increasing difficulty in swallowing. For the past few days the patient had been able to swallow only small quantities of fluids. Thirteen inches from the

teeth there was an obstruction to the passage of all but the smallest œsophageal bougies. October 8: Gastrostomy; modified Kader operation; stomach sewn around the tube by a purse-string suture; edges of stomach sewn to the skin; cone inverted into the stomach by pressure on the tube, and funnel thus formed packed with gauze. Convalescence was uneventful; the wound contracted rapidly; there was only very slight leakage around the tube when the patient was discharged improved on November 8. (*Note*—When the patient returned for examination, four weeks later, there was no leakage from the gastrostomy opening, even when the stomach was filled with fluid.)

Non-malignant Stenosis of Pylorus; Dilatation of Stomach; Gastro-enterostomy with Enteroenterostomy; Cure.—Thomas B., 38 years old, admitted March 4, 1901. There was in this patient's case a history, of seven years' standing, of epigastric distress after meals, with vomiting. For three years he had been treated by daily gastric lavage, but without permanent benefit. He had lost considerable flesh and strength. Examination of the stomach and its contents after a test meal showed that the organ was much enlarged, capacity five pints of fluid. There was a resistance in the pyloric region. The stomach contents after test meal were practically normal. March 5: Operation. Pylorus found very small and thickened; typical entero-enterostomy and gastroenterostomy with Murphy buttons; abdominal incision closed. On March 10, five days after the operation, the patient suddenly complained of severe pain in the abdomen; the wound was found burst open in part and some omentum and a loop of small intestine had prolapsed. These were carefully replaced and the wound packed with gauze. The cause of the separation of the wound edges could not be explained, as a layer suture of the abdominal wall had been made at the operation and the usual laparotomy straps and tight abdominal bandage applied. This accident, however, only slightly delayed convalescence. The patient never had a bad symptom and the wound healed by granulation. The buttons had not yet been passed and could be seen in the right iliac fossa on fluoroscopic examination when the patient was discharged cured on April 11. During his stay in the hospital he had gained many pounds in weight and much strength. He was entirely relieved of his gastric symptoms. (*Note*—Some weeks after his discharge this patient returned on account of cramps in the abdomen, with nausea but no vomiting. The buttons had not yet passed. Operation for their removal was offered and refused.)

Gastric Ulcers; Cicatricial Stricture of Pylorus; Gastroenterostomy; Bronchopneumonia; Death.—Israel S., 37, admitted April 19, 1901, with a three-year history of epigastric pain and vomiting. The pain came on in attacks, but for the past four weeks had been continuous. The patient had lost much in weight and strength. April 20: Laparotomy. Benign stricture of pylorus in a much-dilated

stomach; posterior gastroenterostomy with Murphy button. Twenty-four hours after the operation signs of pneumonia appeared. The wound was opened, but was found to be in good condition. In spite of all treatment, death occurred on April 23. At the postmortem there were found: many ulcers of the stomach; a healed ulcer causing stricture of pylorus; bilateral bronchopneumonia; the peritoneal cavity normal.

Carcinoma of Stomach; Retrocolic Anterior Gastroenterostomy; Improvement.—Conrad K., 52 years old, admitted October 22, 1901, had had a posterior gastroenterostomy done for diffuse carcinoma of the stomach one year before. After the operation, at which time he had been much emaciated, he gained 60 pounds in weight and was relieved of all his symptoms until two months ago. For the past two months he again lost flesh and strength rapidly, was troubled by almost continuous epigastric pain and by frequent vomiting. October 23: Abdomen opened through old scar; entire walls of stomach found studded with tumors of various sizes; one of these had entirely overgrown the site of the old gastroenterostomy and had occluded the opening. Retrocolic anterior gastroenterostomy was performed with the aid of a division of the attachment of the omentum to the greater curvature of the stomach over an area of about two inches, and anastomosis was made by suture between the anterior surface of the stomach near the greater curvature and the continuation of the loop of the ileum used for the former operation; abdomen closed by layer suture. Primary union of wound. Convalescence uneventful; marked gain of flesh and strength when discharged on November 8.

OPERATIONS ON THE GALL BLADDER AND DUCTS—17; 1 DEATH.

	Totals.	Deaths.
Exploration of gall ducts	1	..
Laparotomy and breaking up of adhesions for pericholecystitis.	1	..
Cholecystotomy for cholelithiasis	9	..
" " cholecystitis	1	..
" " cholelithiasis, ideal operation	1	..
" " empyema of gall bladder	1	..
Cholecystectomy for cholelithiasis	2	..
Transduodenal choledochotomy	1	1

Examples of the various operations which were performed for affections of the gall bladder and gall ducts during the past year are here given. Diseases of these organs are looked upon as in many ways similar to affections of the vermiform appendix. There are a number of arguments in favor of the view that the gall bladder, like the appendix, is an organ that is gradually disappearing. The human economy can certainly do without it. Like appendicitis, infection of the gall bladder is very apt to recur, and in a large proportion

of cases this becomes almost a certainty. There are the similar acute attacks, during which there may be great danger to life and operative interference become necessary, although acute cholecystitis is not usually as dangerous as a recurrent attack of acute appendicitis. Therefore the surgical indication is to interfere by operative measures, especially if the attacks recur at short intervals and in spite of internal treatment. Operations in the interval offer the best prognosis both as to life and as regards the radical elimination of the disease. We know that the presence of calculi in the gall bladder always means infection of that organ, hence the most certain method of radical cure is to remove the entire gall bladder—an operation which is in many cases no more dangerous than simple drainage of the viscus.

During the past year few changes in operative technique have been made. The peritoneum is now approached through the right rectus muscle by the blunt separation of its fibres, instead of along the outer border of that muscle. No matter what kind of an operation has been done, the wound is always drained through one or both of its angles.

Acute Cholecystitis; Cholecystotomy and Drainage; Cure.—Emilie K., 47 years of age, was admitted on September 10, 1901. The patient had been in the hospital six months before with jaundice, and had had occasional attacks of pain in the right hypochondriac region since that time. Seven days before admission she began to have pain in the gall-bladder region, which radiated into the back and the right scapular region, with chilly sensations and fever, slight icterus and clay-colored stools. On the day of admission to the hospital the pain had become more severe and the temperature had risen to 104.6°. The patient was a very stout woman, her abdomen was uniformly distended and tender, the entire right hypochondriac region was very sensitive to the touch, the liver extended two finger breadths below the free border of the ribs, and the gall bladder could be distinctly felt as a hard, tender, globular mass at the level of the umbilicus. There was slight general icterus. Temperature 106.2°, pulse 112, respiration 24. Immediate operation was performed. Incision along the outer border of the right rectus muscle; the enlarged and tense gall bladder was carefully walled off from the general peritoneal cavity by gauze and about six ounces of turbid bile and mucus aspirated. On palpation, stones could be felt in the gall bladder and the cystic duct. The gall bladder was incised and considerable mucus and a number of calculi evacuated; the stones in the cystic duct were pushed back into the bladder and removed. The common duct was palpated and found empty. A drainage tube was then introduced into the gall bladder and the serous membrane sewn tightly around

the tube, the organ sutured to the parietal peritoneum, and the lower part of the wound closed by sutures. Convalescence was slow but steady. The wound contracted rapidly; the biliary discharge grew slowly less until it ceased entirely on October 28; the temperature remained normal after the twenty-third day following operation. The patient was discharged cured on November 27, with the wound firmly healed. The patient had several attacks of angina pectoris during the last two weeks of her stay in the hospital.

Cholelithiasis; Ideal Cholecystotomy; Cure.—Esther W., 32 years old, was admitted on October 17, 1901. The patient had had frequent attacks of typical gall-stone colic for the past ten years. For the past five years she had lost weight steadily. When admitted to the hospital there was almost constant colicky pain in the right hypochondriac region. The physical examination was entirely negative. October 18: Operation; nitrous oxide and ether anesthesia. The gall bladder was exposed by an incision four inches long along the outer border of the right rectus muscle; there were no adhesions to the neighboring parts, but the contracted organ was distended with fluid and contained a number of stones. The general peritoneal cavity was protected with gauze packings, the gall bladder incised, and four large calculi removed. The fluid contained was clear bile. As the walls seemed to be normal, the opening was closed with fine Lembert sutures of silk, a small drain led down to the suture line, and the abdominal wall almost entirely closed with interrupted sutures. Convalescence was absolutely uneventful; the patient was discharged cured on November 8. The wound was soundly healed eleven days after the operation.

Cholelithiasis; Choledochotomy; Cure.—Jette K., 44 years old, admitted May 4, 1901. The patient said that she had had frequent attacks of abdominal pain, without fever or jaundice, for the past eight years. Four weeks before admission she had an attack of pain in the right hypochondriac region, with chills and fever. These symptoms continued until three days before admission, when she noticed that she was becoming yellow. Physical examination: Slight conjunctival icterus; a tender mass, of about the size of an egg, which moved with respiration, in the right hypochondriac region; the liver slightly enlarged downward; temperature 101°, pulse 92. May 7: Temperature 102.2°, pulse 100; operation; curved incision near the outer border of the right rectus muscle. The gall bladder not to be found on account of numerous adhesions between the various organs in the right hypochondrium; the common duct exposed with much difficulty and a stone of about the size of a pigeon's egg removed through an incision in the wall of the duct; gauze drainage of the duct. The patient made a rapid convalescence after the operation. A small sinus persisted when she was discharged cured on July 2.

Cholelithiasis; Cholecystectomy; Cure.—James L., 33 years old, admitted July 22, 1901. Thirteen years before the patient had had an attack of peritonitis. From that time on he had had repeated attacks of fever with pain and tenderness in the right hypochondriac region. Two weeks before admission he had a severe attack of pain which lasted thirty-six hours, accompanied by high temperatures. During the last illness the enlarged and tender gall bladder could be felt. Patient never had jaundice. July 22: Operation: incision four inches long parallel to the right costal border. The walls of the gall bladder were found to be much thickened and adherent to the neighboring coils of intestine. After the general peritoneal cavity had been protected by gauze packings, the adhesions were divided between ligatures, the gall bladder separated from the liver, the cystic duct tied off with chromicized catgut, the gall bladder removed by cutting the cystic duct, and the stump cauterized with pure carbolic acid. The wound was freely drained. The walls of the gall bladder were considerably thickened and the organ contained numerous pigment stones. Convalescence was somewhat delayed by the occurrence of a retention abscess around the stump of the cystic duct, noted on the twelfth day after operation. The wound contracted rapidly, however, and convalescence was otherwise uneventful. When the patient was discharged cured on September 9, only a small sinus remained. (*Note*—The wound was entirely healed two weeks later.)

Cholelithiasis; Cholecystectomy; Cure.—Jette S., 29 years old, admitted February 10, 1901. For the past four years the patient had had repeated attacks of typical gall-stone colic. The last attack began seven days before admission with colicky pains in the region of the gall bladder, without fever or jaundice. The patient declared that biliary calculi had been found in her stools. On admission her temperature was 100°, her pulse 114; there was tenderness over the right hypochondriac region, but nothing definite could be felt on account of the patient's very fat abdominal walls. The pain persisted and she became slightly jaundiced. On the sixth day after admission her temperature rose to 102° and operation was decided upon. The gall bladder and cystic duct were filled with stones, but there were few adhesions between these organs and the intestines. The gall bladder was freed from the liver, the cystic duct tied off and cut, and the stump cauterized with pure carbolic acid. A drain was carried down to the stump of the duct and the wound of the abdominal wall partially closed. Convalescence was absolutely uneventful. The temperature was normal after the fourth day, the first dressing was done on the seventh day, the patient was allowed out of bed on the twenty-eighth day, and she was discharged cured on March 20 with a small superficial granulating sinus.

Cholelithiasis; Cholangitis; Transduodenal Choledochotomy; Death.—Mary G., 50 years old, was admitted on August 30, 1901. For the

past twelve years the patient had had typical attacks of gall-stone colic with jaundice, which had increased in frequency. Three weeks before there had been an attack of pain in the epigastrium, with jaundice, chills, fever, and sweats. When she was admitted to the hospital she was deeply jaundiced, the liver was considerably enlarged, the gall bladder was plainly palpable below the free border of the liver, and there was marked tenderness over that organ. Temperature 102.2°, pulse 120. For the following five days the patient's condition remained about the same, except that the temperature became still more elevated. At the operation, which was undertaken on September 5, the liver was found much enlarged, the gall bladder small and surrounded by numerous adhesions; when some of the adhesions were divided, bile and some gas began to escape, and this was found to come from an opening in the second portion of the duodenum. The opening in the latter organ was closed with Lembert stitches. A large stone was to be felt in the common duct near its distal end, and because of the many dense adhesions the duct was exposed by an incision in the second portion of the duodenum, the duct incised, and two large stones removed. The common duct was drained and the opening in the duodenum closed with Lembert sutures. The abdominal wound was partially closed. For the first few days after the operation there was a profuse discharge of bile with a number of small stones from the wound. The patient, however, lost strength rapidly; on the eighth day it became evident that the duodenal incision had opened and that a duodenal fistula had established itself. Operation was at once done and the opening in the duodenum closed with interrupted stitches. The patient did not rally from the second operation and she died on the following day.

OPERATIONS ON THE LIVER AND IN THE SUBPHRENIC REGION.

OPERATIONS, 15; 6 DEATHS.

	Totals.	Deaths.
Aspiration of right subphrenic region	2	..
" " liver	1	..
Excision of calcified echinococcus cyst wall	1	..
Exploratory laparotomy for carcinoma of liver	1	1
Incision and drainage for subphrenic abscess	3	2
" " " " abscess of liver	5	2
Curettement of echinococcus cyst wall	1	..
Incision and drainage of abscesses of liver, multiple	1	1

In the operative treatment of abscesses of the liver it is frequently a difficult question to determine whether the abscess should be approached by the abdominal or the thoracic route. In the following histories examples of both methods are given. The operative results in solitary abscesses have been much improved during the past few years. The majority of the abscesses which we have encountered have been sterile on culture or have contained the bacillus coli com-

munis. The staphylococci and amebæ have sometimes been found. The prognosis in multiple abscesses of the liver is of course a bad one.

Solitary abscesses of the liver, in which there is some probability that the abscess is situated near the upper surface of that organ, should always be approached by the thoracic route. The danger of the opening of the peritoneal cavity is often thus avoided, as there are apt to be adhesions between the peritoneal surface of the diaphragm and the upper surface of the liver. A further advantage of the operation is that it allows of simultaneous opening and drainage of the pleural cavity, if that be required. Although the thoracic method is often employed, in many cases it is easy to avoid invading the pleural cavity by pushing the parietal pleura up out of the way.

Abscess of Liver; Peritonitis; Transperitoneal Incision and Drainage of Liver Abscess; Cure.—Samuel R., 29 years old, was admitted to the medical service October 6, 1901. His present history began several weeks before admission with severe pains in the epigastrium, chills, fever, and sweating. On admission the liver was found to be enlarged, extending from the fourth space to two finger breadths below the ribs. There was tenderness over the liver in front and some resistance in the right lumbar region. Temperature 104°; white blood count, 34,500. The urine contained casts but no bile. The following day the patient's condition was worse, his temperature was high, and he was much prostrated. Aspiration of the right chest was negative. October 8: The patient suddenly complained of severe abdominal pain; his abdomen became rigid and tender; he went into a condition of collapse. A perforative peritonitis was suspected and the patient was transferred to the surgical service for immediate operation. When the abdomen was opened considerable turbid fluid escaped. The appendix was normal. The under surface of the right lobe of the liver was covered with inflammatory exudate. Aspiration of the right lobe of the liver gave thick pus. The needle was left in place as a director, the peritoneal cavity walled off with gauze, the abscess then opened with dressing forceps, drainage tubes inserted, and about 20 ounces of thick pus evacuated. The cavity was drained and the wound partly closed, the operation having lasted eighteen minutes. For two days the patient remained in a precarious condition. He then began to improve, and on the fourth day after the operation the pulse and temperature fell to the normal. There was a profuse discharge of pus from the drainage tubes. Thereafter convalescence was uneventful and he was out of bed by November 5. By November 11 the cavity had contracted considerably and there was only a small amount of discharge of pus from the wound. On the 19th a small quantity of bile was discharged from the sinus which remained; this had almost entirely ceased when he was sent home cured on November 23.

Abscess of Liver; Transpleural Hepatotomy and Drainage; Cure.—Davis K., 42 years of age, was admitted September 7, 1901. Fourteen years before he had had an osteomyelitis of the tibia and tarsus. His present history was of six weeks' duration. It began with pain in the right side, fever, and chilly sensations; no vomiting, no diarrhea, no jaundice. These symptoms persisted without abating until his admission to the hospital. There was dulness over the right side of the chest from the spine of the scapula to the base, with diminished voice and breathing, and the level of dulness descended with the respirations. There was tenderness and edema over the axilla. The liver extended below the level of the navel and was tender on palpation. Aspiration in the eighth space gave pus. Temperature 104°, pulse 124, respiration 28. September 7: Operation; nitrous oxide and ether; two inches of the ninth rib resected in the post-axillary line; diaphragm incised without opening the pleural cavity. An enormous quantity of pus was evacuated. Exploration with the finger disclosed a large cavity bounded above and below by ragged liver tissue. Three large tubes were inserted for drainage, and the wound packed and dressed dry. Convalescence was rapid, and was only interrupted by the appearance of an ischiorectal abscess, which was incised and drained and which healed quickly. The cavity in the liver contracted rapidly; the discharge diminished in quantity daily. The patient was discharged on October 22 with a small sinus. Two weeks later he returned for inspection, when the sinus was found completely healed.

Multiple Abscesses of the Liver; Subphrenic Abscess; Perforation of the Subphrenic Abscess into the Pleura; Incision and Drainage of the Pleural Cavity; Death.—Bernard J., 36 years old, was admitted to the medical service on January 20, 1901. His disease was of twelve weeks' duration, with pain in the left hypochondrium, jaundice, chills, fever, and sweating. The liver was enlarged, the left lobe was tender, and the temperatures fluctuated between 101° and 103°. He was transferred to the surgical service on January 26. Aspiration in the left hypochondrium gave pus. Under eucaine three inches of the eighth left rib were resected, the pleural cavity opened, and a large quantity of fetid pus evacuated. As no opening in the diaphragm could be discovered, the pleural cavity was drained in the usual manner. The patient's condition improved somewhat after the operation. On January 31 he suddenly coughed up a large quantity of pus and blood, and collapsed. In spite of energetic stimulation, death occurred a few hours later. The postmortem examination showed multiple abscesses of the liver, subphrenic abscess, a perforation of one of the abscesses into the pleural cavity and lung, and purulent pericarditis. The pus from the liver abscesses contained the ameba coli.

Carcinoma of Gall Bladder and Liver; Exploratory Laparotomy;

Death from Exhaustion.—Lucy B., 59 years old, admitted October 11, 1901. The patient said that she had had more or less constant pain in the epigastrium for the past ten years. The bowels were always somewhat constipated, and she was sometimes a little jaundiced, but did not vomit. Five weeks before admission the pain became more severe, so that her physician had to give her morphine, and since that time she had lost flesh and strength. The liver was slightly enlarged and the gall bladder apparently palpable; no jaundice; general condition fair. October 18: Exploratory laparotomy along the right rectus musele. The liver contained numerous small white tumors; the gall bladder was small and hard, a larger nodule on the surface of the liver having been mistaken for gall bladder on palpation. Abdomen closed with drainage. The patient grew steadily weaker after the operation. She became deeply jaundiced and died from exhaustion on November 24. The autopsy (pathological number 807) showed advanced carcinoma of the liver and gall bladder, with obstruction of the common duct by a small carcinomatous tumor. Several hard calculi occupied the contracted gall bladder.

Abscess of Liver; Laparotomy; Incision and Drainage of Liver Abscess; Death.—Antoine K., 36 years old, admitted September 21, 1901. Fourteen years before the patient had been told that she had a liver tumor. Three years before she had had chills and fever for several weeks after a confinement. Five weeks before admission she was suddenly attacked with pain in the right hypochondrium and vomiting; the pain subsided after medical treatment, but returned the following day. Patient had been in bed ever since, and had had almost continual pain with occasional vomiting and chilly sensations. For the past week she had sweats and had felt a mass in the region of the liver. The enlarged liver extended almost to the level of the umbilicus, and below it a rounded tumor was to be felt. September 24: Laparotomy along the outer border of the right rectus muscle. The right lobe of the liver was found much enlarged and the omentum was adherent to it. The attempt to separate the adhesions was followed by the escape of some thin pus, which was carefully sponged away. The right lobe of the liver was aspirated, pus obtained, and a large abscess cavity opened and drained according to the usual methods. The patient was in very poor condition when she left the operating table, and she never recovered, but died in a sudden collapse twenty hours later. Postmortem examination not permitted.

Abscess of the Liver; Hepatotomy; Cure.—Horace L., 21 years of age, was admitted as a private patient of Dr. Manges June 15, 1901. The patient was from the South and had had all the symptoms of intermittent fever six months before. He had had pain in the hepatic region and daily rises of temperature for the past month. The liver was enlarged upward and downward and was tender on pressure. On June 21 pus was withdrawn from a point in the post-axillary line with

the aspirating needle. He was transferred to the surgical service for operation on June 22. Two inches of the ninth and tenth ribs were resected in the post-axillary line, the pleural cavity was accidentally opened and walled off with gauze packings, the diaphragm incised, the free peritoneal cavity protected with gauze, and a large abscess of the liver, which contained about one quart of pus, evacuated. The abscess cavity was drained with tubes. Convalescence was absolutely uneventful and the patient was discharged cured on July 25.

Abscess of the Liver; General Peritonitis; Celiotomy; Death.—Victor B., 16 years of age, admitted June 3, 1901. The history was that for the past four days the patient had had pain and tenderness of the abdomen and had been vomiting. The boy's condition was a very poor one; the abdomen was everywhere tender and was distended with fluid; the liver and spleen were enlarged. When the abdomen was opened a large quantity of seropurulent fluid escaped. The appendix, which was somewhat inflamed, was removed and the peritoneal cavity washed out with normal salt solution. Death occurred with all the symptoms of general peritonitis on June 5. The postmortem examination revealed the presence of a large liver abscess.

Abscess of Liver and Subphrenic Region; Empyema; Incision and Drainage of Subphrenic Abscess; Death.—Samuel N., 50 years old, was admitted to the medical service on September 25. He was transferred to the surgical service and operated upon on October 4. Thick pus was obtained by aspiration in the ninth interspace in the post-axillary line. Under eucaine anesthesia part of the ninth rib was resected. The costophrenic sinus having been obliterated by adhesions, the diaphragm was directly incised, and a large abscess in the upper portion of the right lobe of the liver opened and drained. The patient did not respond to stimulation, and, in spite of intravenous infusion and other energetic treatment, he died seventeen hours after the operation. The postmortem examination (pathological number 786) showed a large abscess cavity occupying the right lobe of the liver and the subphrenic space, with a perforation of the diaphragm and empyema.

Subphrenic Abscess; Incision and Drainage; Death.—S. E., a woman 58 years old, was admitted to the medical service of Dr. N. E. Brill on June 21, 1901. For the past four weeks the patient had complained of general weakness and for the past eight days she had had pain in the right side of her chest posteriorly. No cough, no jaundice, no other symptoms. For three days before admission she had had chills. On admission the spleen was found enlarged, but not the liver. There was some tenderness in the right hypochondrium. The patient's condition improved a little during the following few days. On the 28th she suddenly went into collapse. The right hypochondrium was aspirated, pus obtained, and she was at once transferred to the surgical service for operation. The ninth and tenth ribs

were resected in the usual manner in the post-axillary line, the diaphragm incised, a large amount of pus evacuated, the cavity drained, and the patient sent back to bed in a very poor condition. She did not rally, but died on the following day. No autopsy.

Persistent Sinus after Operation for Echinococcus Cyst of the Liver: Calcareous Degeneration of the Cyst Wall: Extirpation of the Cyst Wall: Cure.—Daniel DeM., 63 years old, was transferred from the medical service of Dr. Manges on March 12, 1901. Ten months before, the patient had been operated upon in another hospital for an echinococcus cyst of the liver. In spite of treatment a sinus persisted. In the median line of the abdomen above the umbilicus there was a cicatrix four inches long, in the centre of which was the opening of a discharging sinus which led backward and downward for about three inches. At its bottom was a cavity which held about one ounce of fluid, and whose walls were formed of calcareous material. March 12: Operation; incision along line of old cicatrix; cyst packed with gauze and peritoneal cavity freely opened; sac found adherent to the under surface of the liver above and to the intestines and omentum below, so that it was impossible to separate the firm adhesions on all sides. A large number of calcareous plates of the wall were removed with scissors and forceps, the opening of the cyst sutured to the skin, and the cavity left wide open and drained. The cyst cavity contracted rapidly, but on March 22 it was found necessary to remove some more calcareous tissue under general anesthesia. Thereafter the healing of the wound was uninterrupted; the wound was entirely closed on May 1, the patient was discharged cured on May 3.

OPERATIONS ON THE INTESTINES AND VARIOUS ABDOMINAL OPERATIONS.

OPERATIONS, 35; 8 DEATHS.

	Totals.	Deaths.
Celiotomy, exploratory, for carcinoma of sigmoid flexure	1	..
" " " hematuria	1	..
" " " multiple abscesses of omentum	1	..
" " " enlarged liver	1	..
" " " tumor of colon and bladder	1	1
" " " intestinal obstruction	3	2
" " " general purulent peritonitis	1	1
" for duodenal adhesions	1	..
" " inflammatory omental tumor	1	..
" " secondary abscess after appendicitis	1	..
" " tuberculous peritonitis	2	..
" and section of the phrenocolic ligament	1	..
" " ileotomy for intestinal obstruction	1	1
" " " " " " secondary	1	..
" " duodenorrhaphy, secondary	1	..
" resection of colon for tumor, enteroanastomosis (Maunsell)	1	..
" resection of colon for tumor	3	1
" " " ileum, ascending, transverse, and descending colon for papillomatous colitis	1	..
" and colostomy for carcinoma of colon	2	1

	Totals.	Deaths.
Celiotomy and colostomy for carcinoma of omentum	1	..
" " resection of omentum for intra-abdominal torsion, appendicectomy	2	..
" for intussusception, reduction	3	..
" " chronic intussusception, resection, enteroanastomosis (Maunsell)	1	..
" and resection of colon for carcinoma (Kraske)	1	1
Closure of fecal fistula after appendicitis	1	..
Revision of fecal fistula wound	1	..

Thirty-five operations were done on the intestines and the general abdominal cavity, exclusive of hernia, kidney, the liver and gall bladder, the stomach, and operations for appendicitis. These 35 operations were done on 20 patients, so that in a number of the cases more than one operation had to be done. That the mortality is a high one is of course due to the poor condition in which patients with affections of the kind here described generally apply for hospital treatment. A considerable number of the patients died, not in consequence of the operation, but from the disease from which they were suffering. Thus some of the patients died from exhaustion from malignant disease weeks after the carrying out of operative measures. Others died from the infection of the peritoneal cavity which it was the purpose of the operation to remove. This was the class of cases to which reference was made in the introductory remarks, for which the only chance—and that a very small one—lay in operative interference.

A case of more than ordinary interest, in which part of the ileum, the ascending, transverse, and descending colon were removed on account of a papillomatous colitis, is not reported in this place. It will form the subject of a separate paper in this report.

The history of the patient on whom a celiotomy was done for hematuria will be found abstracted under the heading of "operations on the kidney."

An abstract of the history of a patient with multiple abscesses of the omentum secondary to a strangulated umbilical hernia, in whom the greater part of the omentum was successfully excised, will be found under the heading of "operations on hernia."

The following three cases of intussusception occurring in young children are of interest. In the first patient the occurrence of marked cyanosis is rather unusual. The only symptoms that pointed to an intussusception were the abdominal pains and the vague tumor that was to be felt in the abdomen.

A large chronic ileocolic intussusception in an adult was successfully operated upon, the affected bowel being resected and the divided ends united by the Maunsell suture.

Intussusception; Laparotomy with Reduction; Cure.—Isidore P., 4 years old, had for eight days before admission attacks of abdominal cramps, which recurred at short intervals. On admission, January 30, 1901, the patient looked cyanotic; there was a vague resistance to be felt in the right hypochondrium; the patient cried out with pain every few minutes. The movements were free and did not contain blood. The day following his admission the cyanosis became very marked, and operation was decided upon. Under chloroform anesthesia a mass could be distinctly felt in the right hypochondrium. The laparotomy revealed an ileocecal intussusception which could be easily reduced. The cecum was anchored to the parietal peritoneum by a few sutures, the appendix was removed, the abdomen was closed. Convalescence was uneventful and the patient was discharged cured on February 16.

Intussusception; Laparotomy and Reduction; Cure.—Nathan G., 3 years old, admitted April 15, 1901. On the morning of the child's admission to the hospital he suddenly complained of abdominal pain, rectal tenesmus, vomited several times, and passed some bloody mucus from the rectum. Under anesthesia a soft, sausage-shaped mass was to be felt in the right hypochondrium; laparotomy disclosed an ileocolic intussusception which could be entirely reduced. The ileocecal junction was sutured to the parietal peritoneum and the wound closed. Convalescence was uneventful; the patient was discharged well on April 26.

Intussusception; Laparotomy and Reduction; Cure.—Rosie W., 5½ months old, was admitted on October 18, 1901. On the day before admission the child had suddenly complained of abdominal pain, had vomited, and had had several bloody movements. On examination just before the operation, an elongated tumor could be distinctly felt along the course of the descending colon, and could be followed upward until it was lost beneath the ribs. Laparotomy was performed under chloroform anesthesia, an ileocecal intussusception which extended into the descending colon, or even the sigmoid flexure, was found and reduced, and the abdominal wound entirely closed. Except for slight digestive disturbances, convalescence was rapid and uneventful; the patient was discharged cured on October 25.

Chronic Ileocolic Intussusception; Resection; Cure.—John P., 30 years old, admitted November 6, 1900. Three months before admission, after a severe exertion, the patient drank a large quantity of cold beer, which was followed by an attack of severe, cramp-like pain

in the umbilical region, with vomiting and diarrhea. After two to three days the attack subsided, but ever since he had had recurring attacks of pain in the epigastrium, especially after the ingestion of food. He had lost about 20 pounds in weight. On examination of the abdomen there was to be felt just above the navel a soft tumor lying transversely. When the colon was inflated with air the mass became more prominent. November 10: Operation; chloroform anesthesia. A large ileocolic intussusception was found which was only partially reducible. A longitudinal incision was made in the intussuscipiens and the intussusceptum drawn out. The latter was found to consist of part of the ileum, the cecum and appendix, and part of the ascending colon. This mass, which was about 8 inches long, was resected and the ileum joined to the colon by a typical Maunsell suture. The abdominal wound was closed, except for a small drain down to the anastomosis. Convalescence was uneventful; the temperature was normal on the fourth day, the bowels moved on the ninth day, the patient was discharged cured on the twenty-second day after the operation.

Intestinal Obstruction due to Bands from Old Appendicitis; Operation; Death.—Louis W., 28 years old, was admitted March 12, 1901. Fifteen years before he had an attack similar to the present. For the past five days had severe abdominal pains, and for two days had vomited frequently. Bowels had not moved since the beginning of illness. On admission the abdomen was slightly distended and everywhere tender. The abdomen was opened through a median incision and considerable clear fluid allowed to escape. The intestines were so much distended that several coils were incised and emptied of their contents, the wounds then closed with purse-string sutures. Two omental bands were found in the right iliac fossa, which compressed the ileum near its termination. The appendix lay behind the cecum. It was not acutely inflamed, but was bound to the cecum by old firm adhesions. The two bands were divided, the obstruction being thus relieved, and the abdominal wound was closed. On the day following the operation the patient's condition became so poor that the abdomen was again opened and the bowel incised in several places, a drainage tube being left in the bowel in one place so as to drain away the intestinal contents. In spite of energetic stimulation the patient's condition did not improve and he died of exhaustion forty-eight hours after the operation. The postmortem examination (pathological number 707) showed extensive adhesions between the coils of small intestine.

Intestinal Obstruction due to a Band; Operation; Death.—William F., 45 years old, was transferred from the medical service April 29, 1901. Five months before, a gastroenterostomy had been done in a hospital in Europe. Seven days before, the illness had begun with sudden pain in the left side of the abdomen, vomiting, and constipa-

tion. The bowels had not moved since the first day of the patient's sickness. He was in very poor general condition. Four hours after his admission to the hospital he was transferred to the surgical service and at once operated upon. A firm band was found to compress the small bowel high up, and there were numerous adhesions which bound together the intestines. The constricting band was divided and the abdominal cavity drained. Death occurred from exhaustion twenty-four hours after the operation. No autopsy.

Chronic Intestinal Obstruction; Exploratory Operation; Death from Exhaustion. Benjamin D., 53 years old, admitted September 18, 1901. For six months there had been alternating diarrhœa and constipation, and for the last six weeks vomiting of mucus streaked with blood. As the patient was very feeble, operation was done soon after his admission. No tumor could be located, but the mesenteric glands were enlarged and there were a number of adhesions around the lower part of the duodenum. Several bands were divided and the abdomen then closed without drainage. The patient rapidly failed, dying on the third day after the operation. The postmortem examination (pathological number 782) showed chronic ulcerative gastritis and enteritis with adhesive peritonitis.

Endothelioma of Colon and Bladder; Exploratory Celiotomy; Death from Exhaustion. Morris A., 43 years old, admitted April 2, 1901. Six months before, the patient had had an attack of cramps in the lower part of the abdomen, with vomiting, which lasted several hours. Two weeks later he had an attack similar to the first, and thereafter frequent ones. For the past six weeks continual pain in the lower part of the abdomen; pain on urination; increasing weakness. The urine became very cloudy and microscopical examination made before admission showed that the urine contained striated muscle fibres. Cystoscopic examination disclosed a large, irregular tumor projecting into the bladder at its lower and posterior portion. The patient was then fed on vegetable food exclusively by his physician, with the result that the muscle fibres disappeared from the urine. He was given carmine by mouth, and carmine crystals appeared in his urine. Six weeks before admission he had had several bloody movements, but he never passed gas with his urine and never noticed urine in his stools. On the day before admission he had passed bits of feces with his urine. The patient was admitted on April 2, in wretched condition; an irregular nodular mass was to be felt in the prevesical region, extending almost to the level of the umbilicus; there were enlarged glands to be felt in the left iliac fossa. Rectal examination detected a rectal tumor about the size of a small apple. April 6: Exploratory celiotomy; incision from the symphysis pubis to the umbilicus; upper part of rectum enormously dilated; the bowel punctured and some of the contents evacuated; a large tumor of the lower end of the sigmoid flexure, firmly adherent to the posterior

wall of the bladder, and inoperable, was found; the rectum below the tumor sutured to the anterior abdominal wall and the abdomen then closed. The patient lost flesh and strength rapidly, and he died from exhaustion on April 13. The autopsy showed that there was present a large carcinoma of the lower end of the sigmoid flexure which had perforated into the bladder, the communication being about one centimetre in diameter.

General Peritonitis; No Operation; Death.—Mamie G., 11 years of age, admitted August 3, died August 4, 1901. Two weeks before admission the patient had an attack of abdominal pain which lasted for several days. Three days before admission she was suddenly attacked with general abdominal pain, fever, vomiting, and constipation. These symptoms became steadily worse. When first seen the child was almost moribund. The temperature was 105.8°, pulse 170, respiration 34. In spite of infusion and active stimulation, the patient grew rapidly worse and died eight hours later. No autopsy.

General Purulent Peritonitis, probably due to Appendicitis; Exploratory Laparotomy; Death.—Jette S., 18 years old, admitted June 10, 1901, with a history that she had had pain in the epigastrium for the past three days. The pain gradually became worse on the right side of the abdomen and she had chills, fever, and vomiting. On admission the girl was in collapse. The abdomen was uniformly rigid and tender. After the infusion of several pints of saline solution into the median basilic vein, the abdomen was opened under local (eucaine) anesthesia. The peritoneal cavity contained foul pus and particles of feces. A careful search was made for the appendix, but it could not be found, so the cavity was thoroughly washed out with normal salt solution, freely drained, and the wound left wide open. The patient did not rally from her collapse; she died a few hours later. No autopsy.

Constipation due to constriction of the splenic flexure of the colon by the phrenocolic ligament was successfully relieved by a celiotomy and division of the tight constricting band in the following case.

Constriction of the Splenic Flexure of the Colon by the Phrenocolic Ligament; Operation; Cure.—Dora S., 43 years old, admitted May 16, 1901. The patient had had frequent attacks of pain in the left side of the abdomen for the past three years. Her bowels had been constipated and she had suffered much from eructations of gas. For the past five weeks she had had almost continual pain in her abdomen. May 18: Celiotomy. The phrenocolic ligament was found to be a thick band which ran over the splenic flexure of the colon and compressed it. The band was divided between two ligatures and the abdomen closed. Convalescence was uneventful; the patient was discharged on June 11, relieved of most of her symptoms.

Carcinoma of the Splenic Flexure of the Colon; Acute Intestinal Obstruction; Right Inguinal Colostomy; Resection of Tumor of Colon; End-to-end Anastomosis by Suture; Closure of Colostomy Opening; Cure.—Abraham S., 70 years old, was admitted to the medical service on November 9, 1900. The patient had lost weight for the past year. He declared positively that he had never been constipated. For seven days before admission he had had no movement; had had some pain in his abdomen, but had not vomited. After his admission all attempts to move the patient's bowels were unsuccessful. The abdominal distension became very marked; he complained of much pain; he began to vomit. On November 10 he was transferred to the surgical service for operation. At the operation, which was done at once, the general peritoneal cavity was found to contain clear fluid, but the intestines were so much distended that search for the obstruction was deemed inadvisable. Right inguinal colostomy was done, the colon opened at once, and much gas and fluid allowed to escape. The patient improved very rapidly after the colostomy; within twenty-four hours most of the abdominal distension had disappeared, so that a tumor could be felt in the upper part of the abdomen on the left side. December 15: Operation; incision over the tumor along the outer border of the left rectus muscle. A tumor of the splenic flexure of the colon was found firmly adherent to the neighboring structures. The tumor was excised, the ends of the colon being united to each other by a double layer of interrupted silk sutures. A drain was inserted down to the point of the intestinal anastomosis and the abdominal wound partially closed. Convalescence was absolutely uneventful; the patient was out of bed on January 20, when only several small sinuses remained. On January 22 the colostomy opening was closed in the following manner: The skin was first incised around the artificial anus and the opening into the colon closed by suturing the two skin edges together. The general peritoneal cavity was then freely opened and a number of dense adhesions divided and the appendix removed. After the general cavity had been walled off with gauze, the colostomy wound was again opened, the skin edges trimmed off with scissors, and the opening in the bowel closed by a double layer of Lembert sutures; free drainage. Convalescence from the second operation was also uneventful; the patient gained flesh and strength rapidly, the wound contracted slowly. By March 20, only two small sinuses remained, with which he was discharged on that date. Pathological examination of the tumor showed it to be an epithelial carcinoma. (*Note*—This patient died of recurrence about a year after operation.)

Ulcerating Carcinoma of the Colon and Ileum; Resection and End-to-end Anastomosis by Suture; Cure.—Gussie L., 28 years of age, was admitted January 23, 1901. The patient had suffered from constipation for several years. For the past ten months she had had frequent attacks of pain in the left iliac region lasting several days.

Six months later she was confined to bed for five weeks for what her physician told her was "peritonitis." For eight days she had a great deal of abdominal pain and had noticed a tumor in the left side of her abdomen. At the same time she observed some blood in her stools. Physical examination showed that the patient was well nourished; the abdomen lax, not tender; a tumor of about the size of a fist, in the left iliac fossa, which was very hard and slightly tender. The abdomen was opened over the tumor, which was found to consist of parts of the colon, ileum, and omentum. The entire tumor mass was excised, the transverse colon divided between ligatures, and the lower end of the descending colon united to the proximal segment of the transverse colon by end-to-end suture. The part of the ileum which was affected was excised, with end-to-end anastomosis of the bowel segments by suture. A part of the colon now remained—namely, from the splenic flexure to the middle of the descending colon. The splenic end was closed by sutures and the lower end fixed in the angle of the wound. The entire wound was left wide open and drained. The patient stood the operation very well; the temperature dropped to the normal on the fourth day, the bowels moved on the seventh day, there was a little feculent discharge from the excluded bowel for several weeks. By February 19 the wound had contracted very much, the discharge was slight, the patient felt well. On February 28 a small mass was to be felt in the left groin, which had decreased in size by March 19. On that day the patient was discharged cured with a small granulating wound. (*Note*—This patient died of a recurrence some months later.)

Carcinoma of Colon Pelvinum; Exploratory Celiotomy; Extirpation by Combined Sacral and Abdominal Routes; Death from Angina Pectoris.—Leopold H., 50 years old, was admitted August 2, 1901. The patient had been under observation for several months for a suspected abdominal tumor. Physical examination had been entirely negative, but he had lost much flesh and strength and had been very constipated. Exploratory laparotomy on August 3 revealed a tumor of the upper end of the rectum and lower end of the sigmoid flexure, which was very slightly adherent to the bladder. The abdomen was closed and the wound healed by primary union. On account of the patient's urgent plea for a radical operation the extirpation of the tumor was attempted on August 13. The sacrum and coccyx were resected after the method of Kraske, the rectum freed from its attachments, and the tumor made freely movable except at its uppermost portion. The peritoneum was opened widely in the rectovesical culde-sac. The sacral wound was then packed with gauze and the abdomen opened through the old incision, the general peritoneal cavity protected with gauze packings, the tumor peeled off from its attachments to the bladder, and the intestine divided above the tumor. Both ends of the bowel were then drawn out through the sacral wound. The pelvic cavity was then packed with gauze, and the

tumor and several inches of the adjoining bowel excised. Although the operation thus far had taken little more than one hour, the patient became so weak that an intravenous infusion was given. The stump of the sigmoid was now drawn through a lateral incision in the stump of the rectum and fixed in place with a few silk sutures. The rectum was then returned to its place and the entire wound packed. The patient's condition remained poor; he complained of pain in the precordial region, became cyanosed, and died suddenly eight hours later. At the autopsy the heart was found in an advanced condition of myocarditis, with thrombosis of several of the branches of one of the coronary arteries.

Carcinoma of the Descending Colon; Abdominal Carcinosis; Operation; Death from Exhaustion.—Jacob K., 39 years old, was admitted December 19, 1900. For fourteen days before admission he noticed a redness and swelling of his umbilicus. For one day he had severe pain in the abdomen, without fever, vomiting, or constipation. On admission his abdomen was distended and tender; there was a red and tender swelling around the umbilicus, a mass in the splenic region, and a large, reducible right inguinal hernia. At the operation, which was done soon after his admission, the peritoneal cavity was found to contain turbid fluid and there were numerous fresh adhesions in the splenic region where a tumor was to be felt. The adhesions were divided, and the colon, which was very friable, was opened by accident. The mass around the navel was found to be a small one. The wound was left wide open and the tumor isolated in the wound with gauze packings. On December 29 the tumor was excised and the openings in the colon drained. On January 18 the scrotal hernia was operated upon; the sac contained omentum with carcinomatous nodules, and the sac wall was covered with small tumors; the diseased omentum, the testicle, and the hernial sac were removed and a typical Bassini done. After this operation the patient continued slowly to decline. He died from exhaustion on April 12. Postmortem examination (pathological number 718): Extensive carcinosis of the intestines and peritoneum.

Carcinoma of Splenic Flexure of Colon; Acute Intestinal Obstruction; Right Inguinal Colostomy; Death.—Leonora C., 52 years old, admitted June 30, 1901. The patient was admitted in a very poor condition, temperature 102°, pulse 140, with a history of constipation for one year, very obstinate constipation for three weeks, absolute constipation with abdominal distension and vomiting for two days. The abdomen was very much distended and tender; there was a large, tender mass in the left hypochondriac region. Right inguinal colostomy was performed at once and the ascending colon found enormously distended and partly gangrenous. Death occurred six hours after the operation. Postmortem examination (pathological number 743): Carcinoma of splenic flexure; metastases in liver; tuberculosis of left kidney and ureter.

During the past year two cases of intra-abdominal torsion of the omentum were successfully operated upon. Most of the cases of this kind that have been reported in medical literature have occurred in patients with herniæ, and the torsion in these cases was usually believed to have been due to the repeated reductions of portions of the omentum which had entered the hernial sac. In at least one of the cases that were met with on the second surgical service the patient never had had a hernia.

Intra-abdominal Omental Torsion; Resection of the Twisted Omentum; Cure.—Harris D., 30 years old, was admitted July 6, 1901. Five days before, the patient was attacked with general abdominal pain, most marked in the right iliac region, accompanied by constipation. No chills, but moderate fever and nausea. The symptoms persisted unabated until his admission to the hospital. The abdomen was slightly distended; a large, hard, tender mass, dull to percussion, was felt in the right iliac region. July 6: Operation; the abdominal wall was incised along the outer border of the right rectus muscle. A mass of omentum of about the size of an adult fist was found twisted upon itself 180°; it was almost black in color and very hard; the appendix lay behind the mass and seemed to be normal. The twisted portion of the omentum was ligated at its base and excised, the appendix removed, and the wound partially closed, with drainage. Convalescence was uneventful; the wound healed rapidly; the patient was discharged cured on August 3.

The other case was reported in full in the *Annals of Surgery* for November, 1900.

HERNIOTOMIES—50; 6 DEATHS.

	Totals.	Primary union.	Suppuration.	Open treatment.	Deaths.
Inguinal, reducible, Bassini's opération	32	23	4	4	..
" irreducible	1	1	..	..	..
" strangulated	5	..	..	3	2
Femoral, reducible	2	1	1	..	..
" strangulated	4	..	..	3	1
Umbilical, "	1	..	..	1	..
Ventral	3	2	..	..	1
Internal, strangulated (Fossa Treitz)	1	..	..	..	1
Perineal, congenital	1	..	..	..	1

Strangulated Inguinal Hernia; Herniotomy; Recovery.—Israel S., 5 years old, admitted October 30, 1900. The parents of the child stated that a right-sided scrotal hernia had been present for three

years, that it had always been well controlled by a truss, and that it had always been reducible until the day before the child's admission to the hospital. The hernia had then become irreducible and had caused pain and vomiting. In the right inguinal and scrotal region there was a tumor the size of two fists. On opening the sac a considerable quantity of bloody fluid and a loop of distended small intestine were encountered. The constriction was in the inguinal canal, and was relieved by slitting up the aponeurosis of the external oblique. The gut was only very slightly congested on its outer aspect, but at its mesenteric attachment it was deeply injected. There were several thrombosed vessels in the mesentery. A rubber ligature was passed through the mesentery and left lying in the wound, the intestine being replaced in the abdominal cavity. The lower part of the wound was drained with gauze. Convalescence was uneventful, and the patient was discharged cured thirty-six days after the operation.

Strangulated Inguinal Hernia; Herniotomy; Death.—Hyman T., 24 years old, admitted November 7, 1901. Patient had had a left inguinal hernia, which three days before admission had become strangulated. He entered the hospital in wretched condition, with rapid pulse and feculent vomiting. On opening the sac some turbid fluid and a loop of small intestine were encountered. The patient's condition was so poor that further operative interference was contraindicated. The patient did not rally, and died eight hours after operation.

Strangulated Inguinal Hernia (reduced en bloc); Laparotomy for Intestinal Obstruction; Death.—Abraham K., 42 years old, admitted August 11, 1901. It was not possible to obtain a satisfactory history from the patient. He had had a right inguinal hernia for many years. Two days before his admission he had been seized with cramp-like pain in the abdomen, and his bowels had not moved, in spite of the fact that cathartics had been administered. Patient stated that he had not vomited. The abdomen was much distended and tympanitic, except in the flanks, where there was dulness on percussion. In the right side of the scrotum a hernia the size of a lemon could be felt; it slipped back readily into the abdomen. Just after his admission the patient was given a high enema, which was followed by the passage of large quantities of gas and feces. After the enema the patient vomited two pus-basinfuls of yellowish fluid. Three hours later 8 ounces of brown feculent fluid were vomited. A median laparotomy was then performed. There was considerable clear fluid in the abdominal cavity and some recent fibrin. A loop of distended gut was traced downward, when suddenly a portion was reached where the gut showed a distinct lateral grooving—*i.e.*, the whole circumference was not constricted, but only a portion of the wall of the gut. On relieving this loop of gut the previously collapsed loops at once became distended. The involved loop, although of deep brown color, seemed viable after the application of heat. In the absence

of any other cause for the obstruction, the diagnosis of a Littré's hernia was made. The abdomen was closed with silkworm-gut sutures. The patient did not vomit after the operation, but his pulse became more and more feeble, and death took place fifteen hours afterward.

Strangulated Inguinal Hernia; Herniotomy; Recovery.—Jacob L., 31 years old, admitted November 3, 1901. Patient had had a left inguinal hernia, from which he had suffered no inconvenience, for seventeen years. On the day of admission he had been seized with severe pain in the hernial sac and in the region of the umbilicus; there had been no vomiting. On examination the left side of the scrotum was found the seat of a tender, elastic swelling which was irreducible and gave no impulse on coughing. There was a slight hourglass constriction near the centre of the tumor. On opening the sac two transverse constricting bands (intercolumnar fascia) were divided, and the contents of the sac were found to be nine inches of deeply injected small intestine, besides some dark-colored fluid. After the constriction was relieved, the gut resumed its normal appearance and was reduced. A typical Bassini operation was then done, a small rubber tissue drain being left at the lower angle of the wound. With the exception of a slight superficial infection at the upper angle of the wound, recovery was uneventful and the patient was discharged, with the wound entirely healed, twenty days after operation.

Strangulated Inguinal Hernia; Gangrene of Small Intestine; Resection of Intestine; Recovery.—Berel J., 63 years old, admitted January 16, 1901. The man had had a right inguinal hernia for seventeen years, during which time it had four times become irreducible. At 4 A.M. on the day of admission the patient awoke with severe pain in the region of the umbilicus; the hernia could not be reduced. Two hours later patient had a chill and vomited. On examination a tense, tender mass was found in the right inguinal region; attempts at reduction were futile. Operation was performed under local anesthesia, eucaine 2 per cent. On opening the sac some bloody fluid and a loop of small intestine were found. The gut was red and contained thrombosed vessels, and there were a few hemorrhagic areas in the mesentery. As the extensive thrombosis made the viability of the gut doubtful, the questionable loop was resected with the aid of a Murphy button, reinforced with fine silk sutures. The intestine was then replaced in the abdominal cavity with one strip of gauze in front and one behind. Part of the sac was excised and part allowed to remain. The lower half of the wound was left open. The button was passed sixteen days after operation. The patient made an uneventful recovery, and was discharged cured twenty-eight days after operation.

Strangulated Femoral Hernia; General Peritonitis; Gangrene of Intestine; Herniotomy; Laparotomy; Resection of Intestine; Death.—

Chaje T., 53 years old, admitted April 6, 1901. Patient had always been well up to the time of sailing from Glasgow sixteen days before her admission to the hospital. She had been seasick and vomited during the first two days of the trip. The vomiting had then ceased, to recur two days before her landing in New York. On the day of landing, four days before her admission, patient had been seized with abdominal cramps, and a mass had been noticed in the left groin. The vomiting persisted until the day before admission, when it became feculent. According to the patient's statement, her bowels had not moved for two weeks. In the left groin there was a mass about the size of a hen's egg, slightly tender, tympanitic on percussion, and not reducible. On incision a gangrenous hernial sac was found. There was some bloody fluid coming from the peritoneal cavity; otherwise the sac was empty. The neck of the sac was sutured and the wound left open. On the day following the operation the vomiting continued and the bowels could not be made to move. The general condition was becoming steadily worse, so that on April 9, two days after the herniotomy, an exploratory laparotomy was determined upon. On opening the abdomen through a median incision, the general peritoneal cavity was found full of fluid fecal matter with numerous lymph adhesions. In the left iliac fossa a coil of small intestine was found with three inches of its wall completely sloughed away. The gangrenous portion of intestine was removed and the ends of the gut were united by a few silk sutures. The peritoneal cavity was repeatedly flushed with saline solution and the sutured loop of gut left in the wound. The wound was left open. The patient died shortly after the operation. At the autopsy the small intestine was found gangrenous for about 30 cm., continuous with that portion of the intestine which had been resected. The line of union of the cut ends of the gut was firm and there was no perforation in the gangrenous intestine.

Strangulated Femoral Hernia; Abortion; Herniotomy; Curetting; Recovery.—Rachel B., 36 years old, admitted March 19, 1901. There had been no history of a hernia. Three days before her admission patient had been seized with cramp-like abdominal pain, followed by vomiting. Eight hours after the onset of the attack a swelling had been noticed in the right femoral region. Marked intestinal peristalsis was visible. In the right femoral region there was a swelling the size of a pear; it was irreducible, slightly tender, and dull on percussion. On incision the constriction was found at the external ring. The sac contained a loop of intestine and some omentum. The omentum was resected and the intestine reduced. The wound was left open. On April 4 patient aborted, and the uterus was curetted. Recovery was uneventful, and the patient was discharged cured thirty-seven days after operation.

Strangulated Femoral Hernia; Herniotomy; Recovery.—Bessie J.,

30 years old, admitted February 10, 1901. Nine years before admission a hernia had appeared in the right femoral region, and had remained visible for several days. The hernia had reappeared several times, only remaining visible a few days at a time. Eight days before admission, following exertion, the hernia had reappeared and could not be reduced. The bowels had moved daily; there had been no vomiting and no abdominal pain. In the right femoral region a tumor, the size of an egg and somewhat tender on pressure, could be felt. It was dull on percussion, not reducible, and there was no impulse on coughing. About two ounces of clear fluid and some congested omentum were found in the sac. It was not necessary to cut the constricting ring. The omentum was resected and a Bassini operation was done. A small drain was left in each angle of the wound. Uneventful recovery. Discharged cured twenty days after operation.

Strangulated Femoral Hernia; Herniotomy; Recovery.—Minna W., 35 years old, admitted November 7, 1901. Patient had had a reducible left femoral hernia for several years. Three months before admission the hernia first gave signs of strangulation. It was reduced, and the patient had since then worn a truss. On the day before admission there was pain at the site of the hernia and in the region of the umbilicus. The hernia could not be reduced; there was repeated vomiting and the bowels did not move. On opening the sac a Littré's hernia of a loop of small intestine was found. After relieving the constriction, the loop of gut, which was viable, was returned and a Bassini operation was done. The skin was closed with silk sutures and a small drain left at the lower angle. Discharged cured eighteen days after operation.

Strangulated Umbilical Hernia; Herniotomy; Cure.—Rosalie W., 50 years old, admitted October 26, 1901. Patient had had an umbilical hernia for many years. In spite of occasional attacks of pain and strangulation, the hernia had always been reducible. Patient had been suffering from diabetes for several years. On the day before admission the attack began with pain in the hernia and vomiting. The bowels had not moved since the onset of the attack. There was a large, somewhat tender, irreducible umbilical hernia present. On account of the presence of diabetes, no general anesthetic was given. The operation was done with the aid of eucaine 3 per cent., and very little pain was experienced. The sac was opened and the omentum was found adherent all around the neck of the sac, covering loops of transverse colon and small intestine. The constricting ring was freely incised, the omentum resected, and the gut replaced. The hernial sac was not removed, as it was firmly adherent. The wound was closed with through-and-through sutures, the central portion of the wound being kept open with a packing. The wound healed well, and the patient was discharged cured twenty days after operation.

Congenital Perineal Hernia; Retention of Urine; Suprapubic Cystotomy; Death.—Infant G., four days old, admitted January 10, 1901. The infant had been born with a large perineal hernia. She was brought to the hospital on account of retention of urine. On admission eight ounces of urine were withdrawn with a catheter. The stump of the umbilical cord was still attached. The heart and lungs were normal. In the hypogastrium there was a tumor corresponding to the distended bladder. Occupying the whole of the perineal region there was a large, soft mass with the anus at its summit. This mass was in part reducible, and became tense on crying. Both labia majora were red and swollen, and there was a mucoid discharge from the vagina. Dr. Koplik was of the opinion that part of the bony pelvis was lacking. After being catheterized for several days the infant was able to pass some urine, but the tumor in the hypogastrium persisted. On January 20, 1901, a suprapubic cystotomy was done under chloroform. Three to four ounces of very turbid, foul urine were first evacuated. The incision was then enlarged and 8 to 10 ounces of clear urine were encountered (sacculation of bladder). The perineal tumor had now almost entirely disappeared. The infant died thirty-six hours after the operation.

Strangulated Internal Hernia; Gangrene of Intestine; Resection of Intestine; Death.—Abraham M., 50 years old, admitted September 17, 1901. Patient had had typhoid fever fifteen years before his admission. Otherwise he had been well until three days before he entered the hospital, when he was seized with general abdominal pain. On the following day he began to vomit. The bowels moved daily and the pain persisted, but was not localized. The general condition was poor. The abdomen was distended, tympanitic in the middle, dull in the flanks. No mass could be felt. The abdomen was opened by a median incision above the umbilicus. The patient suddenly collapsed and required active stimulation. The small intestine was considerably distended. A collapsed coil was found to lead to a pocket behind the radix mesenterii at about the level of the transverse portion of the duodenum (fossa of Treitz). As the intestine was pulled out a small perforation was found. This was closed with Lembert sutures, but not before considerable fluid feces had escaped. As the loop was pulled out further, a gangrenous area, 2 cm. in diameter, was found near the mesenteric attachment. From this area fluid feces escaped. Four inches of intestine were resected by end-to-end union with the aid of a Murphy button. The peritoneum adjacent to the proximal segment had been considerably torn and the rent had to be repaired with several Lembert sutures. As a result of this there was considerable constriction of the gut. The serosa around the proximal portion of the button was torn so that some leakage was expected. The patient's condition had become very bad, so that the operation had to be stopped. The affected loop was left outside the abdominal cavity. After irrigating with normal saline

solution, the rest of the intestines were returned to the abdomen. The peritoneal cavity was irrigated with hot saline solution and the abdominal wall was partly closed with through-and-through sutures. The patient died a few hours after the operation.

OPERATIONS ON THE RECTUM, ANUS, AND ANAL REGION. TOTAL, 49; 1 DEATH.

	Totals.	Deaths.
Dilatation of sphincter for fissure	2	..
Fistula in ano opened and packed	10	..
Hemorrhoids, clamp and cautery operation	20	..
" ligature operation	2	..
" " and clamp and cautery	1	..
" and prolapse of rectum, clamp and cautery	1	..
Rectal polyp	1	..
Ischiorectal abscess incised and drained	8	..
Perineal fistula opened and packed	2	..
Carcinoma of rectum, preliminary operation	1	1
" " " resection	1	..

There were but two cases of cancer of the rectum admitted early enough for radical operation.

Carcinoma of Rectum; Preliminary Osteoplastic Operation; Death.—Carrie S., 47 years old, admitted September 2, 1901. Patient stated that her father had died of cancer. Three months before her admission she began to feel vague abdominal pains radiating to the back. The bowels had only moved with the aid of cathartics, but no blood had been observed in the stools. Patient had lost some flesh and strength, and had become very anemic. Examination revealed a small, freely movable mass in the anterior wall of the rectum about four inches from the anus. The stools were examined for hemin, with a positive result. On September 7, at 3 P.M., under gas and ether anesthesia, the growth was found to be adherent to the promontory of the sacrum. Owing to this fact and to the fact that the patient was a virgin, it was deemed inadvisable to attempt to extirpate the growth by the vaginal route. The patient was then placed on her right side with the legs and thighs flexed. An incision was made from the anus to the posterior superior spine of the ilium on the left side. All the soft parts down to the sacrum and coccyx were divided; those over the sacrum were dissected over to the right side as a flap. The sacrum was then chiselled through transversely between the second and third foramina, and the bone flap turned over to the right side. This gave an excellent exposure of the rectum and permitted a thorough palpation of the growth. In spite of the fact that there had been very little bleeding, the patient's pulse had become very weak. It was therefore deemed wise to defer the resection of the rectum. The wound was loosely packed with iodoform gauze and a few silkworm-gut sutures were introduced. During the

night following, the patient was restless, the tongue dry, the pulse rapid, feeble, and irregular. There was frequent vomiting and involuntary micturition. Toward morning, after repeated stimulation, there was a distinct improvement in the condition. But the patient was very restless, and vomited bile frequently. At 10:10 A.M. the patient complained of nausea and of thirst, and had a chill. There was marked pallor, and the pulse could not be felt at the wrist. Breathing ceased at 10:15 A.M.

Carcinoma of Rectum; Resection of Rectum; Cure.—Malie S., 38 years old, admitted September 29, 1900. Patient gave neither a tubercular nor a specific history. She had had eight children, and during each pregnancy had been troubled with hemorrhoids. Five months before admission patient began to have frequent stools accompanied by the passage of blood. Since then there had always been a small amount of blood in the stools, which were sometimes formed, sometimes fluid. Patient had had some pain in the rectum and had lost a little flesh. Extending upward from the anus for a distance of two inches there were numerous hard nodules, situated chiefly upon the posterior wall of the rectum. Vaginal examination was negative. Operation was performed on October 2, 1900, with the patient in the lithotomy position. The anus was closed with silk sutures and an incision made around it down to the rectal wall. A median incision was then made through the perineum. The tumor was found to involve the rectum for about three inches above the anus, which was also involved. The involved portion of the rectum was excised and the proximal portion of the rectum was brought down without twisting and united to the skin by interrupted sutures of silk. The perineal wound was closed with silk and catgut sutures, packings inserted in the different angles of the wound, and a large tampon canula introduced into the rectum. The bowels were not allowed to move until ten days after operation. By the seventeenth day patient could control her stools, and on the twenty-fourth day she was out of bed. Thereafter convalescence was uninterrupted, with the exception of the development of a cystitis which soon subsided under treatment. Patient was discharged cured on December 2, with fair control of the bowel.

OPERATIONS ON THE KIDNEY—20; 6 DEATHS.

	Totals.	Deaths.
Nephropexy for movable kidney	2	..
Nephrotomy, exploratory	1	..
" for acute nephritis	1	1
" " hemorrhagic nephritis	1	1
" " pyelonephritis	1	1
" " pyonephrosis	3	1
" " tuberculous kidney	1	..
" " septic nephritis	1	..
" " chronic "	1	1

Nephrectomy for	sarcoma	1	1
"	" congenital hydronephrosis	1	..
"	" pyelonephritis	1	..
"	" pyonephrosis	3	..
"	" tuberculous kidney	1	..
"	" septic nephritis	1	..

Catheterization of the ureter on the supposedly diseased side was performed several times. Several times a nephrotomy was performed as a preliminary operation, to be followed after a shorter or longer period by the removal of the kidney.

Tuberculosis of Kidney; Nephrotomy; Nephrectomy; Cure.—Morris P., 40 years old, admitted January 14, 1901. Patient had had an attack of hematuria twenty years before admission, lasting two days. Ten years later he had had a similar attack, and a third one, lasting ten days, four years before his admission to the hospital. On admission the patient stated that he had been sick eight days. The attack had begun with hematuria. On the following day there had been pain in both lumbar regions, which persisted. There had often been clots in the urine. Nothing abnormal was found about the thoracic or abdominal viscera. Urine was acid, 1,030, containing a trace of albumin and much blood. On January 25 blood was seen through the cystoscope coming from the right ureter. A nephrotomy was then done on the right side. The kidney was split and the finger inserted, but nothing was found. The kidney incision was packed with gauze. For five days following the operation the urine was full of blood and the patient was losing ground. Accordingly, on January 31, a nephrectomy was performed. The kidney was large and contained numerous miliary tubercles. From the microscopic sections the pathologist reported tuberculosis. The urine contained blood for only two days after the nephrectomy. The wound healed very slowly and had to be revised several times. The patient was discharged cured, with a small sinus, on July 1, 1901.

Pyonephrosis; Cystoscopy; Nephrotomy; Nephrectomy; Cure.—Rose G., 25 years old, admitted December 21, 1900. The patient said she had always enjoyed good health until ten months before her admission to the hospital. At that time she had suffered from pain which radiated in various directions from the left lumbar region, and there had been some fever present. Since the beginning of the trouble micturition had been increased in frequency but decreased in amount. Patient had been in bed during part of the time and had become weak and emaciated. In the left lumbar region there was a large tumor, dull on percussion, which extended from the free border of the ribs to within an inch of the iliac crest. The tumor did not move with respiration and was to the outer side of the colon. The right kidney could be readily felt below the free border of the

ribs. On December 22 an unsuccessful attempt was made to catheterize the left ureter by Kelly's method; the trigonum was edematous and bled very readily. There was a daily rise in temperature and there was much pus in the urine. On December 24 nephrotomy was done on the left side through an oblique lumbar incision. The kidney substance was much thinned and on incising it there was a profuse discharge of thick, creamy pus. On January 14 a secondary operation was performed on the same side, and two other pus cavities in the kidney were opened. Following the secondary operation the patient did not improve much and there was a continuous profuse purulent discharge from the wound. Accordingly, on February 5, a nephrectomy was performed. The pelvis and calices of the kidney were dilated and filled with pus; there was very little cortex remaining. Recovery was slow, but the wound finally healed, and the patient was discharged cured May 5, 1901.

Septic Nephritis with Multiple Abscesses; Nephrotomy; Nephrectomy; Cure.—Hyman G., 13 years old, admitted March 11, 1901.

Pyonephrosis; Nephrolithiasis; Nephrotomy; Nephrectomy; Cure.—Max G., 40 years old, admitted August 28, 1901.

Congenital Hydronephrosis; Nephrectomy; Cure.—Samuel A., 9 months old, admitted August 21, 1901.

The above three cases, all of unusual interest, were reported *in extenso* in the *New York Medical Record*, May, 1902, in an article on "The Indications for Nephrectomy."

Sarcoma of Kidney; Exploratory Laparotomy; Nephrectomy; Death.—Eli M., 2½ years old, admitted May 4, 1901. The father had died of cerebral syphilis. Four weeks before the child was admitted to the hospital the mother had noticed that his abdomen began to increase in size. There had been fever and sweating. The bowels had moved regularly. On May 5 the child was transferred to the Isolation House for scarlatina. While in the Isolation House the abdomen continued to increase in size; the urine contained albumin and casts, and showed a marked increase in the amount of urea. The child lost considerable flesh and strength. On May 20 the case was readmitted to the surgical division. The abdomen was then very much distended, but there were no signs of free fluid. There was a tumor occupying the left lumbar and hypochondriac regions; the tumor was hard, but fluctuating in part. The contour was smooth, and the tumor did not move with respiration. On May 21 an exploratory laparotomy was done. The liver and spleen were somewhat enlarged. The right kidney was slightly enlarged. In the left loin there was a tumor of the size of a cocoanut occupying the region of

the left kidney and extending into the false pelvis. There was a large quantity of clear fluid in the peritoneal cavity. The abdominal wound was closed and the tumor exposed by an oblique incision in the left lumbar region. The tumor was easily peeled out of the kidney capsule, although the peritoneum was opened, with the escape of considerable fluid. The tumor was very soft and ruptured twice. There was considerable bleeding. The pedicle was ligated with silk and the tumor removed. During the operation the child needed considerable stimulation. The pulse failed steadily and the child died eight hours after the operation.

Acute Nephritis; Double Nephrotomy; Death.—Louis U., 41 years old, admitted June 17, 1901. For two years patient had had pain in both lumbar regions and urination had been painful. Three days before admission he had been suddenly seized with severe pain in the left lumbar region. There had been repeated vomiting, absolute constipation, and absolute anuria. The left kidney was first exposed by a lumbar incision. The organ was much enlarged and bled very freely on being incised. The pelvis of the kidney was packed with gauze and the wound left open. The right kidney was then exposed. Nothing abnormal was found on palpation and on aspiration, so the capsule was not incised. This wound was likewise left open. During the four days following the operations there was very little urine excreted, but the bowels were made to move freely. On June 21 the wound over the right kidney was enlarged, the kidney incised, and a piece removed for examination. On the following day 11 ounces of urine were passed, but the patient became very noisy and restless. On June 26, 19 ounces of urine were passed; urea 1.7 per cent. On July 1 a profuse diarrhea set in and patient became stuporous and apathetic. On July 4 coma set in and patient died. An incomplete autopsy revealed calculi in the right kidney, though the prominent symptoms had been referred to the left side.

Hemorrhagic Nephritis; Exploratory Laparotomy; Nephrotomy; Suprapubic Cystotomy; Death.—Rachel L., 44 years old, admitted October 11, 1901. Patient had had typhoid fever eight years before her admission to the hospital. There had been no pneumonia, rheumatism, or malaria. Patient had given birth to ten children and had had three abortions. One year before admission urination had begun to be painful. There had been no blood noticed in the urine until a few weeks before operation. The blood had steadily increased in quantity until the patient passed almost pure blood. During this time pain developed in the right hypochondrium. On examination the liver was found to extend below the free border of the ribs. In the right hypochondrium there was a mass, the size of an orange, which moved with respiration. Immediately after admission the patient passed ten ounces of almost pure blood per urethram. An exploratory laparotomy was at once performed in the median line

below the umbilicus. The right kidney was palpated and appeared small, firm, and somewhat low down. The liver was large and formed most of the mass felt on external palpation; the left kidney seemed normal. The abdominal incision was then closed. The urethra was then dilated and the finger introduced into the bladder, but nothing abnormal was felt. Cystoscopic examination was also negative. For eight days following the operation there was no hematuria. On October 20, owing to the presence of blood in the urine, a second cystoscopic examination was made. There were a few clots found in the bladder, but no blood was seen coming from either ureter. Just after the cystoscopy, hematuria set in and large clots were passed. On October 21 a cystoscopy was attempted. Owing to the quantity of blood that was being poured into the bladder, it was unsuccessful. A lumbar nephrotomy was then done on the right side. The kidney, which appeared normal, was split longitudinally and a piece removed for examination. The kidney wound was packed with gauze after the ureter had been found patent. As the bleeding from the bladder continued, a suprapubic cystotomy was done. The blood was found coming from the ureter in a steady stream. An olivary bougie was inserted into the ureter through the urethra, and the bleeding ceased. The bladder was closed by suture and the rest of the wound left open. In spite of two intravenous saline infusions and rectal and hypodermatic stimulation, the patient did not rally and died four hours after operation. Autopsy showed not the slightest ulceration of either ureter or of the bladder, and there was no hemorrhagic disease of the renal pelves. There was, however, an acute hemorrhagic nephritis, which accounted for the bleeding and for the death from acute anemia.

OPERATIONS ON THE BLADDER AND PROSTATE. TOTAL, 11: 1 DEATH.

Bladder—2; No Death.

	Totals.	Deaths.
Suprapubic cystotomy for chronic cystitis	1	..
" " " calculus	1	..

Prostate—10; 1 Death.

Suprapubic cystotomy for prostatic hypertrophy	4	1
Incision of prostatic abscess	2	..
Prostatectomy for hypertrophy	4	..

For reports of the cases of prostatectomy the reader is referred to the article on "Suprapubic Cystotomy in Operations upon the Prostate," to be found in this volume.

OPERATIONS ON THE URETHRA—13.

	Totals.
Urethrotomy, internal, for stricture	3
" external, " "	6
Periurethral abscess, incision	4

OPERATIONS ON THE TESTIS—14.

Varicocele, extirpation	6
Hydrocele, Winkelmann's operation	2
" Bergmann's "	2
" Volkmann's "	1
Tumor, excision	1
Strangulation, torsion of cord, excision	1
Tuberculous globus minor, plastic for sterility	1

OPERATIONS ON THE PENIS—2.

Meatotomy for hypospadias	2

Winkelmann's operation for hydrocele, eversion of the sac, was twice performed with satisfactory results. The operation was once performed under local anesthesia and once under gas and ether. A small incision was made into the scrotum, the fluid was evacuated, and the testis drawn out of the sac. The sac was thus inverted and the cut edges of the sac united with catgut sutures. The testis was then reintroduced into the scrotum and the skin united over it. The patients remain in bed four or five days, and leave the hospital after ten to fourteen days.

Strangulation of Testis; Torsion of Cord; Orchidectomy; Cure.—Moses L., 15 years old, admitted July 8, 1901. Three days before admission the boy had been seized with pain in the right groin and abdomen, associated with fever and restlessness. A swelling, the size of a hazelnut, developed in the right groin, which became reddened and tender. There had been no vomiting. The boy stated that he had lifted a heavy weight five days before the pain set in. The bowels had been constipated, but moved slightly after an enema. The boy walked with a distinct limp, favoring the right side. The abdomen was neither rigid nor distended. On the right side of the scrotum the skin was edematous and red, and there was a small, tender swelling extending up into the inguinal canal; there was no impulse on coughing. On incision the testis was found almost black, due to a torsion of the cord. After untwisting, the testis failed to regain its vitality, so it was removed. There was no hernia present. Recovery was uneventful.

Tuberculous Globus Minor; Plastic for Sterility; Unimproved.—Wolf R., 31 years old, admitted December 21, 1900. There was no tubercular family history and no personal history of tuberculosis or syphilis. The man had been married twelve years and had had one child a year after marriage. Four years later he had contracted gonorrhea complicated by an inflammation of the left testis. The

wife of the patient had not been pregnant since the birth of her child. Microscopical examination of the seminal fluid showed absence of spermatozoa. Under chloroform a vertical incision two and a half inches long was made on the right side of the scrotum. The vas on this side was exposed and appeared normal. It was cut through about one and a half inches above the globus minor of the epididymis, and a filiform bougie was passed into the proximal end. It passed in without any obstruction. On withdrawing the bougie the tip was covered with a mucoid material. Microscopic examination of this material showed it to contain the head of an occasional spermatozoön and granular material. The bougie was then passed down the distal end of the vas, but was obstructed just above the globus minor. The vas was dissected up to the globus major and a vertical incision made into this. Immediate examination of the material therefrom showed active spermatozoa. The proximal end of the vas was now seized between the fingers after a filiform bougie had been passed into the lumen, and a longitudinal incision was made, splitting the canal. The cut edges of this incision were turned down into the incised globus major and fastened there by three silk sutures. The distal end of the vas was left in the wound. A rubber protective drain was left at the lower angle, and the rest of the wound sutured. Three days after operation tubercle bacilli were found in the sputum. On the following day the prostate was massaged and the discharge examined for spermatozoa, but none were found. The urine was also examined daily for spermatozoa, but likewise with a negative result. The wound healed by primary union. The patient was discharged from the hospital thirteen days after operation. Repeated examinations of the prostatic discharge failed to show the presence of any spermatozoa.

AMPUTATIONS—11; 3 DEATHS.

Hip	2	Foot	1
Thigh	3	Toe	5

Amputation at the hip joint was performed twice, in each case for sarcoma of the femur. In the one case Wyeth's pins were used, and in the other the common iliac artery was tied as a preliminary procedure. Both cases recovered.

Diabetic Gangrene of Foot; Amputation of Thigh; Death.—Isaac G., admitted and operated on January 23, 1900. The patient had diabetes of nine years' standing, gangrene of two toes of nine weeks' standing, and marked arteriosclerosis. Amputation through middle of thigh was done a few hours after admission. The urine contained 4 per cent. of sugar, and acetone, but no diacetic acid. The acetone disappeared after the operation, but death occurred in coma four days later.

Diabetic Gangrene of Foot; Amputation of Thigh; Death in Coma.—Bernhard A., 58 years of age, admitted January 18, 1900, operated January 19, died January 20. The urine contained 3 per cent. of sugar and acetone. The large toe of one foot was gangrenous. Temperature 103.6°, pulse 110. Amputation through middle of thigh. Death, in coma, after twenty-four hours. No autopsy.

Diabetic Gangrene of Foot; Amputation of Leg; Death.—Julius S., 59 years old, was admitted and operated upon September 9, 1900, for gangrene of the left foot. The urine contained 3½ per cent. of sugar, but no acetone or diacetic acid. Amputation through middle of leg. The patient did fairly well for three days, but on September 12 he became comatose suddenly and died a few minutes later. No autopsy.

Subperiosteal Sarcoma of Femur; Ligation of Common Iliac Artery; Amputation at Hip Joint; Cure.—Benjamin L., 8 years old, admitted September 22, 1900. On August 19, 1899, the boy had been discharged as cured, after having had his left scapula removed for sarcoma. Six months before his readmission he had complained of some pain, on walking, in the left thigh. At that time he had been examined by Dr. Lilienthal, who had advised his return to the hospital, as there was some thickening about the greater trochanter on the left side. On his return to the hospital the boy complained of severe pain on moving the left limb, but had lost no weight. Over the left scapular region there was the scar of the former operation. Motion of the left upper extremity was good; the arm could be raised to nearly 90°. Over the left hip there was a fusiform swelling, slightly painful and extending over the lower part of the ilium. The swelling seemed to involve the greater trochanter and the upper third of the femur. All motion was painful. Operation was performed September 23, 1901, under chloroform. A vertical incision was made over the outer aspect of the left thigh to ascertain the extent of the involvement of the tumor. It was found to involve the greater trochanter and surrounding soft parts. An incision three and a half inches long was then made in the left iliac region and the common iliac artery was ligated with silk. The abdominal incision was then closed. A vertical incision was now made over the outer aspect of the hip, and continuous with the incision in the thigh. A circular incision was then made through the skin, which was dissected up to the hip. The muscles were divided high up with a fair amount of bleeding, especially posteriorly. The head of the femur was exarticulated in the usual manner. The flap consisted entirely of skin and subcutaneous tissue. A drain was left in the acetabulum, the wound otherwise being closed. The tumor was found to extend from the junction of the neck and shaft to three and a half inches below the greater trochanter. Convalescence was uneventful, and the boy was discharged with the wound completely healed on December 10.

Osteosarcoma of Femur; Amputation at Hip Joint; Cure.—Abraham S., 40 years old, admitted November 5, 1900. There was no

history of syphilis. At the age of 16 the patient had been struck on the inner side of the left knee. There had been no subsequent swelling or redness, and no pain on motion; but on pressure the point of injury had always remained tender. Five years before admission the man had noticed a marked atrophy of the left leg. A year before his admission he had noticed a swelling about the left knee, on the inner side. This gradually increased in size, being painful only on pressure and on motion. Soon he began to have pain in the left hip, so that he could not lie on that side. Five months before admission the man went to Bellevue Hospital, where a piece of the tumor was excised and examined. Thereafter he received as treatment frequent injections of a fluid into the tumor. Shortly after the tumor increased in size and became more painful. After three weeks of fever an incision was made into the mass and considerable pus was evacuated. Thereafter the tumor became much smaller, less painful, and the fever subsided. Four weeks before his admission the wound had entirely healed. Two days before admission the man noticed that he had diminished power over the muscles on the right side of the face and eyelid, and that he had less motion in the right side of the tongue. There had been no premonitory symptoms. The man entered the hospital with a paresis of the muscles of the right side of the face, but there was no deviation of the tongue. There was increased knee jerk on the right side, and ankle clonus. The left leg was held flexed at the knee, making an angle of thirty degrees, and there was marked atrophy of the thigh, leg, and foot. On the anterior and inner aspect of the lower end of the femur there was a large, diffuse swelling, which fluctuated but was not tender. At the lowest point of the tumor there was a sinus which led down to bone. A small piece of the tumor was removed for examination, and was pronounced spindle-celled sarcoma.

Amputation at the hip joint was performed on November 24. An Esmarch bandage was applied from the left foot to the knee, and the Wyeth pins were passed in the prescribed manner. A circular incision was made four inches below the left anterior superior spine, and an external vertical incision. The muscles were dissected up from the bone to the capsule of the joint. A longitudinal incision was made into the capsule and the joint opened. The leg and thigh were now rotated outward and the head of the femur forced out of the joint. The ligamentum teres and the posterior muscles were then cut, a skin-and-muscle flap remaining. There was practically no bleeding. When the head of the femur was removed from the acetabulum, the Wyeth pins slipped somewhat, but the vessels were quickly caught and no bleeding followed. A gauze drain was introduced into the acetabulum and the wound was closed with zinc plaster, no sutures whatever being employed. The first dressing was changed on the tenth day. The wound healed by primary union, and the man left the hospital on the twenty-fifth day.

RESECTION OF JOINTS—6.

Elbow	1	Knee	1
Hip	1	Ankle	3

Tuberculosis of Elbow Joint; Atypical Resection; Cure.—Morris K., 35 years old, was admitted January 19, 1901. Three months before admission the elbow was resected on account of an old fracture and tuberculosis with a stiff elbow. A sinus persisted. January 22, operation; ether; resection; longitudinal incision five inches long over posterior aspect of joint; ends of bones freed from soft parts in the usual manner; entire olecranon process of ulna, articular surface of humerus up to the epicondyles, and articular surface of radius removed with the saw. All disease in the soft parts removed with the scissors; iodoform rubbed into wound surfaces; wound entirely closed, excepting for small drain in lowermost part. Convalescence was uneventful; the wound was entirely healed on the twenty-ninth day; the patient was discharged cured on the thirty-sixth day. Full extension at the elbow possible, flexion almost to right angle, very good rotation of forearm, when the patient returned for observation two months later.

Tuberculosis of Hip Joint; Resection of Hip; Cure.—Julius W., 14 years old, admitted May 6, 1901. The family history was negative. The boy had always been well, and had had no joint or lung trouble. Four weeks before admission the boy began to complain of pain in the right knee. The pain subsided, but a few days later, while running, the boy had fallen on the outer side of the right knee. He walked home and went to bed, where he had remained up to the time of his admission, complaining of pain in the right knee. On examination some swelling was found about the right hip. There was considerable rigidity of the surrounding muscles and marked tenderness over the greater trochanter and upper end of the femur. There was neither swelling nor tenderness about the right knee. The limb was put up in a Buck's extension apparatus for twelve days, but no improvement took place. On May 18 the boy was anesthetized and an abnormal mobility of the hip was discovered, together with crepitus, so that a fracture was suspected. A curved incision was made over the greater trochanter, with the convexity backward. The joint was aspirated and blood and pus obtained. The capsule was opened and several fragments of bone felt in the joint, and the neck of the femur was found fractured. The neck of the femur was removed with the chisel. The head of the femur was found loose inside the joint, and was removed. To secure better drainage the greater trochanter was removed. The acetabular cavity was slightly roughened, but not markedly eroded. The roughened bone ends were curetted, the wound washed with iodoform ether and packed with iodoform gauze. A Buck's extension splint was applied. Examination of the fragments showed separation of the epiphysis of the head of the

femur. The cartilage covering the head of the bone was entirely eroded. There were several miliary abscesses in the neck of the femur. On July 12 a hip fixation and extension brace was applied and the boy allowed to walk with crutches. The wound granulated slowly, and the boy was discharged on August 17 with a sinus two inches deep. The sinus soon healed, and the boy was able to walk very well with his hip splint. There was about 2 cm. shortening on the affected side.

OSTEOTOMIES—14; 2 DEATHS.

	Totals.	Deaths.
For osteomyelitis of femur	4	1
" " " tibia	6	1
" " " ulna	1	..
" double genu valgum	1	..
" malunion after fracture of femur	1	..
" manus vara, osteoplasty of ulna	1	..

Manus Vara after Osteomyelitis of Radius; Osteoplasty; Improvement.—Carroll W., 9 years old, admitted August 9, 1901, had a very marked manus vara as the result of the interference in the growth of the radius from an old osteomyelitis with relative overgrowth of the ulna. The hand was fixed at a right angle to the forearm. August 10, under nitrous oxide and ether narcosis, about one-half inch of the ulna was resected from its middle, the fragments dovetailed into each other and united with chromic catgut. Convalescence was uneventful. The patient was discharged on August 21 with a small superficial sinus. At the time of discharge the hand was nearly in line with the forearm.

Osteomyelitis of Tibia; Purulent Pericarditis; Pyopneumothorax; Multiple Abscesses; Osteotomy; Paracentesis of Pericardium; Incision of Abscesses; Death.—Ernestine R., 8 years old, admitted December 27, 1900. There was no history of trauma or of an infectious disease. Twelve days before admission the child began to complain of pain in the tibia. The leg became more and more swollen. There was continued fever, but no chills. There was delirium at times. On admission, temperature 103.8°, pulse 118, respiration 42. The entire left leg was swollen, red, and edematous. Deep fluctuation was readily obtained. Under chloroform a free incision was made over the anterior aspect of the left tibia and a large amount of thick pus was evacuated. The periosteum had been raised from the bone. The medulla of the opened end was found to contain pus. It was curetted and packed with gauze. On the following day an abscess below the right knee opened spontaneously. The pus from both legs contained staphylococcus aureus. On December 29 an incision was made on the under surface of the right knee and a large amount of pus was evacuated. The blood culture showed the presence of great numbers of staphylococcus aureus. On January 6 an abscess on the right

chest wall was opened. On the following day an abscess on the left arm was opened. On January 11 the pericardium was aspirated in the fifth space, a half-inch inside of the nipple line, and pus was withdrawn. An abscess in the left axilla was also opened. Staphylococci were found in the urine. On January 12 pulmonary edema set in. Pus was again withdrawn from the pericardium, and the child died a few hours later.

MISCELLANEOUS OPERATIONS. TOTAL, 8; 2 DEATHS.

	Totals.	Deaths.
Mycotic femoral aneurism; ligation of external iliac artery, femoral artery and vein	1	1
Endometritis; curetting	2	..
Pyemic abscess of back; incision	1	..
Intramural uterine fibroma; myomectomy	1	1
Ovarian cyst; twisted pedicle; extirpation	1	..
Double pyosalpinx; double oöphorectomy	1	..
Pyosalpinx and appendicitis; oöphorectomy and appendicectomy	1	..

Mycotic Femoral Aneurism; Ligation of External Iliac Artery, Femoral Artery and Vein; Pulmonary Embolism; Death.—May C., 25 years old, admitted April 13, 1901. There was no history of syphilis or gonorrhea or rheumatism. Patient had been married four years and had had two children. The first child died at 11 months of lung disease. The second child was living and healthy. During the second pregnancy there had been swelling of the left foot. Three years before admission an abscess in the left breast had been opened. Six weeks before admission patient took cold, and had cough with mucous expectoration. This lasted about two weeks. As the cough was getting better, patient noticed pain in the left groin on coughing, and several small nodules were felt in the groin. Three weeks before admission the patient noticed an increase in the swelling in the left groin, which then began to pulsate. There had been so much pain in the groin that patient had been in bed for four weeks prior to her entrance into the hospital. The physician who had observed the case outside stated that the femoral glands were first enlarged, and that there was no pulsation present until a week after the glands became enlarged. On examination marked pulsation of the vessels of the neck was noticed. There was a marked difference between the pulsation of the two radial arteries, the right being decidedly stronger. There was a loud blowing systolic murmur at the apex of the heart, which was also heard in the axilla and posteriorly. The second pulmonic sound was accentuated. In the left femoral region there was an oval, elastic swelling about the size of a small hen's egg. The tumor was painful to the touch, and over it there was a loud bruit. Operation on April 13 under gas and ether. An incision was made over the tumor to make the diagnosis of aneurism certain. A three-inch incision was then made a little above and

parallel to Poupart's ligament. The external iliac artery was tied in two places, and cut between the ligatures. With the intention of tying the femoral artery below the sac, dissection of the lower end of the sac was attempted. The blunt end of the knife perforated the sac and a profuse hemorrhage resulted, which was controlled after half an hour's effort and the loss of considerable blood. Finally both the femoral artery and vein were tied and all bleeding ceased. The patient left the table in good condition, with a pulse of 120, the pulse having been 120 before the operation. During the early part of the night the pulse continued of the same quality. Then it rapidly increased in frequency up to 160. Five hours later the pulse dropped even more rapidly to 120. Concomitant with the rise in pulse the temperature rose from 98° to 104°. The following morning the pulse was dicrotic. The patient complained of great pain in the left leg; in the toes sensation was absent. During the night of April 14 the pulse became much poorer, but toward morning of April 15 the pulse became stronger and more regular, down to 108 in frequency. At about 11 in the morning the patient suddenly ceased to breathe, and in a few minutes the heart stopped beating. At the autopsy the right auricle and ventricle were found dilated. The aortic valve flaps were thickened and retracted, and there was a vegetation on one flap. The spleen was five times its normal size. The kidneys were the seat of a chronic nephritis. The femoral artery on the left side showed slight atheromatous changes. At the place where the profunda is given off, the wall of the femoral artery was defective for a distance of 1 cm., and the vessel communicated with a sac about 2½ cm. in diameter. The sac contained thrombotic masses. The femoral vein had a small defect in its wall on the external and anterior aspect, where the vein led into the aneurismal sac.

Intramural Uterine Fibroma; Myomectomy; Death.—Lizzie G., 39 years old, admitted October 14, 1901. Patient had been married several years, but had never been pregnant. In April, 1900, she had had a severe attack of abdominal pain with vomiting and diarrhea. She was operated on at that time by Dr. Lilienthal, and an ovarian cyst and an inflamed appendix were removed. A uterine tumor was observed at the operation. On entering the hospital the patient declared she had been well after the operation, except for the discomfort caused by the abdominal tumor. Menstruation had become protracted and profuse. On examination a large, hard mass was felt in the hypogastrium; it was freely movable laterally, but fixed below. On bimanual examination the tumor was found to be connected with the uterus.

Operation was performed on October 15. An incision was made just to the left of the median scar. The tumor was lifted out of the abdomen with some difficulty; it was adherent in several places by broad, thin, and very slightly vascular adhesions, which were cut. The uterus with the contained tumor was about the size of a uterus

in the sixth month of pregnancy. After the base of the uterus was surrounded by an elastic ligature, its anterior wall was incised and the tumor was shelled out by blunt dissection, with very little loss of blood. The principal bleeding vessels were clamped and tied. The uterine cavity was not opened. The elastic ligature was then removed, and the bleeding vessels in the uterine wall ligated. The wound in the uterine wall was then sutured in several layers with catgut. The uterus was then dropped back into the abdomen. The abdomen was closed with through-and-through sutures. On October 16 there was marked abdominal distension. The bowels moved after the administration of a cathartic. On October 17 the patient was more comfortable. There was a free movement of the bowels. On the following day there was slight abdominal distension and tenderness. The edges of the abdominal wound were partly necrotic. The wound was partly opened, and a wet dressing applied. The temperature had risen to 104° F. and the pulse to 132. On October 21 there was considerable purulent discharge from the wound. On the following day there was marked pain and tenderness in the abdomen, and an exploratory laparotomy was performed. The median wound was opened up, but only a few drops of pus were found, not enough to account for the patient's wretched condition. The peritoneum was opened, but nothing abnormal was found. A small packing was introduced and the incision partly closed. Vaginal examination showed a slight bulging in the right vault. On aspiration two syringefuls of seropurulent fluid were withdrawn. In spite of active stimulation, the pulse became more and more feeble and the patient died on October 23.

CAUSES OF DEATH. TOTAL, 63.

	Operation.	No operation.
Abscess, alveolar; septic pneumonia; sepsis	1	..
" of liver; purulent peritonitis	2	..
" " " subphrenic abscess perforating pleura and lung	1	..
" of liver	1	..
" subphrenic; asthenia; sepsis	1	..
" retropharyngeal; pneumonia; edema of lungs	1	..
" of lung; bronchiectasis	1	..
" " thigh, pyemic; sepsis; gastroenteritis	1	..
Adenitis, submaxillary; marasmus	1	..
Angina Ludovici; enteritis; septic pneumonia	1	..
Arthritis of ankle, suppurative; sepsis	1	..
Aneurism, arterio-venous, of femoral vessels	1	..
Appendicitis, acute perforative; purulent peritonitis	2	..
" general peritonitis	1	..
" acute perforative	1	..
" gangrenous; diffuse peritonitis	..	2
" " " "	1	..

	Operation	No operation
Appendicitis, gangrenous; sepsis	1	..
" abscess, multiple perforations of intestine; sepsis	1	..
" chronic; pericarditis; atheroma of aorta; emphysema	1	..
Burns of esophagus, sulphuric acid; bronchopneumonia	..	1
Carcinoma of colon; general carcinosis; cachexia	1	..
" " splenic flexure of colon; intestinal obstruction.	1	..
" " sigmoid colon; surgical shock	1	..
" " stomach	3	..
" " " asthenia	..	1
Empyema, chronic; shock	1	..
Fibroma of uterus; peritonitis	1	..
Gall stones; cholelithiasis; duodenal fistula; starvation	1	..
Gangrene, diabetic, of foot; sepsis	1	..
" of foot; atheroma of arteries; diabetes; nephritis; sepsis	1	..
Hernia, ventral; myocarditis; shock	1	..
" inguinal, strangulated	2	..
" femoral, strangulated, gangrenous; general peritonitis	1	..
" perineal, congenital; retention of urine; cystitis; asthenia	1	..
" internal, strangulated; general peritonitis	1	..
Hypertrophied prostate; cystitis; asthenia	1	..
Intestinal obstruction due to bands	3	..
Nephritis, acute; uremia	1	..
" hemorrhagic	1	..
Neoplasm of adrenal; sepsis	1	..
Osteomyelitis of tibia, acute suppurative; staphylococcemia	1	..
" acute, of femur; staphylococcemia; sepsis	1	..
Pyonephrosis; pyemia	1	..
Pyopneumothorax	1	..
Peritonitis, acute general; plumbism	..	1
Sarcoma of back; sarcoma of liver, primary; cachexia	1	..
" " intestine and bladder; general peritonitis	1	..
" " kidney; shock	1	..
" " " cachexia	1	..
" " rectum; pulmonary embolism	1	..
Sarcomatosis, general, asthenia, primary, in intestine	1	..
Stenosis of pylorus after ulcer; sepsis	1	..
Tuberculosis of knee; general tuberculosis	1	..
Wound of scalp, infected; septic bronchopneumonia	1	..

REPORT OF THE DEPARTMENT OF GENERAL SURGERY.

REPORT OF THE SECOND SURGICAL DIVISION.

December 1, 1901, to December 1, 1902.

HOWARD LILIENTHAL, M.D.,
ATTENDING SURGEON.

JOSEPH WIENER, JR., M.D., CHARLES A. ELSBERG, M.D.,
ADJUNCT ATTENDING SURGEONS.

IN the following report the histories for the most part speak for themselves. As usual, all the fatal cases have been reported, and a review of these causes us to conclude that all occurred in patients whose condition was desperate when they came for treatment. We do not feel that in any instance, had we the ground to cover again, a material change in the treatment would be made.

The usual antiseptic methods have been followed, and rubber gloves have been almost universally worn, both in the operating room and at the ward dressings.

DISEASES TREATED IN THE SECOND SURGICAL DIVISION.

TOTAL, 619.

	Cured.	Improved.	Unimproved.	Died.	No operation.	Total.
Cranium—10.						
Sebaceous cyst of scalp	1	..	..	..	..	1
Epitheliomatous ulcer of scalp	1	..	..	..	..	1
Suppurative mastoiditis	1	..	..	..	..	1
Sinus after mastoiditis	1	..	..	..	..	1
Depressed fracture of skull	3	..	..	..	..	3
Abscess of brain	..	..	..	1	..	1
Fracture of base of skull	1	..	..	..	..	1
Contusion of skull	1	..	..	..	..	1

	Cured.	Improved.	Unimproved.	Died.	No operation	Total
Face and Mouth—31.						
Lips—1						
Harelip	1					1
Nose—3.						
Cicatrix of nose			1		1	1
Abscess of; meningitis				1		1
Suppurative ethmoiditis				1	1	1
Face—9.						
Infectious parotitis	1				1	1
Carcinoma of cheek		1				1
Sarcoma " "		1			1	1
" " ear and parotid	1					1
Burns of face	1				1	1
Nevus of cheek			1		1	1
Incised wound of brow	1				1	1
Perichondritis of auricle		1			1	1
Erysipelas of face	1				1	1
Superior Maxilla—2.						
Fibrosarcoma of	1					1
Cyst of	1					1
Inferior Maxilla—9.						
Osteomyelitis of	7	1		1		9
Oral Cavity—7.						
Alveolar abscess	1					1
Salivary calculus	1					1
Infected ranula	1					1
Epithelioma of tongue	1					1
Caries of tooth	1					1
Cleft palate			1		1	1
Hemorrhage after tonsillotomy	1					1
Neck—31.						
Abscess	2	2				4
Phlegmon	1					1
Wound of	1					1
Carbuncle	1					1
Sebaceous cyst	1					1
Lymphosarcoma	1					1
Tuberculous adenitis	6					6
Submaxillary abscess	4			1		5
Branchiogenetic cyst	2					2
Thyroglossal cyst	1					1
Thyroid cyst	1					1
Parathyroid cyst	1					1
Goitre	2					2
Congenital fistula	1					1
Hyoid fistula	1					1
Secondary carcinoma of glands				1	1	1
" sarcoma " "			1		1	1

	Cured.	Improved.	Unimproved.	Died.	No operation.	Total.
Pharynx—5.						
Tumor of	..	..	1	..	1	1
Retropharyngeal abscess	4	..	..	..	..	4
Larynx—1.						
Epiglottiditis	..	1	..	..	1	1
Upper Extremity—29.						
Shoulder—3.						
Periarticular abscess	1	..	..	..	..	1
Fracture of clavicle	1	..	..	..	1	1
Necrosis " "	1	..	..	..	..	1
Axilla—3.						
Adenitis	3	..	..	..	..	3
Arm—4.						
Burns of	1	..	..	..	..	1
Ulcer of	1	..	..	..	1	1
Gumma of humerus	1	..	..	..	..	1
Acute osteomyelitis of humerus	..	..	..	1	1	1
Forearm—10.						
Cellulitis	4	..	..	..	..	4
Laceration of extensor tendons	1	..	..	..	..	1
Deformity of elbow	1	..	..	..	..	1
Suppurative tuberculous arthritis, elbow	1	1	1	..	1	3
Compound fracture of forearm	1	..	..	..	1	1
Hand—9.						
Manus valga	1	..	..	..	..	1
Wound of hand	1	..	..	..	1	1
Gangrene of finger	1	..	..	..	..	1
Carbolic gangrene of thumb	1	..	..	..	..	1
Traumatic defect of palm	1	..	..	..	..	1
Compound fracture of phalanx	2	..	..	..	1	2
Osteomyelitis of phalanx	2	..	..	..	..	2
Breast—6.						
Carcinoma of	4	..	..	..	..	4
Fibroma of	1	..	..	..	..	1
Suppurative mastitis	1	..	..	..	..	1
Thorax—7.						
Chronic osteomyelitis of ribs	1	..	..	..	..	1
Tuberculous " " " and sternum	1	..	..	..	..	1
Necrosis of rib	1	..	..	..	..	1
Empyema	2	..	..	1	..	2
Sinus after empyema	..	1	..	..	..	1
Pyopneumothorax	..	..	..	1	..	1

	Cured.	Improved	Unimproved	Died.	No operation	Total
Spine—1.						
Tuberculous osteomyelitis	..	1	..	..	..	1
Abdominal Wall—3.						
Abscess of	3	..	..	..	..	3
Stomach—6.						
Carcinoma	1	..	2	2	2	5
Benign stenosis of pylorus	1	..	..	..	..	1
Esophagus—1.						
Carcinoma of	..	1	..	..	..	1
Intestine—30.						
Acute intestinal obstruction	..	..	..	3	3	5
incomplete " "	..	1	..	..	1	1
Acute intussusception	1	..	..	4	..	5
Volvulus	..	..	..	2	..	2
Enteroptosis	..	..	1	..	1	1
Fecal fistula	2	..	..	..	..	2
Perityphlitic abscess	..	..	..	1	..	1
Tumor of cecum, inflammatory	..	..	..	1	..	1
Sarcoma of intestine	1	..	..	..	..	1
Tumor of large intestine	..	..	1	1	..	2
Carcinoma of colon	..	..	..	3	..	3
Ulcerative colitis; abscess of lung	..	..	..	1	..	1
Chronic ulcerative colitis	..	..	..	1	..	1
Typhoid perforation	1	..	..	3	..	4
Liver—13.						
Abscess	5	..	..	2	..	7
Multiple abscesses	..	..	..	1	..	1
" " suppurative portal thrombosis	..	..	..	1	..	1
Suppurating gumma	1	..	..	..	..	1
Cholangitis	..	..	..	1	..	1
Cirrhosis	..	..	..	1	..	1
Carcinoma	..	1	..	..	..	1
Gall Bladder and Ducts—30.						
Acute cholecystitis	7	1	..	..	..	8
Gangrenous "	4	..	..	..	..	4
Empyema of gall bladder	3	..	..	..	..	3
" " " " peritonitis	..	..	..	1	..	1
Cholelithiasis	8	1	1	3	2	13
Biliary fistula	1	..	..	..	..	1
Appendix—118.						
Appendicitis, acute catarrhal	15	..	..	..	1	15
" chronic	29	..	..	..	1	29
" acute gangrenous	22	..	..	1	..	23
" " " abscess	19	..	..	2	..	21

	Cured.	Improved.	Unimproved.	Died.	No operation.	Total.
Appendix—*Continued.*						
Appendicitis, acute gangrenous; diffuse peritonitis	9	..	..	..	..	9
" " " general "	..	..	..	4	..	4
" " " intestinal obstruction	..	..	..	1	..	1
" " " multiple abscesses	..	..	..	1	..	1
" acute, abscess	11	..	..	1	..	12
Empyema of appendix	3	..	..	..	..	3
Other Abdominal Diseases—19.						
Intra-abdominal abscess	4	..	..	..	..	4
General purulent peritonitis	..	..	..	4	1	4
Tuberculous peritonitis	..	1	1	2	3	4
Post-operative adhesions	3	..	..	..	..	3
Sinus after appendicectomy	1	..	..	..	..	1
Intra-abdominal omental torsion	1	..	..	..	..	1
Carcinoma of omentum	..	..	1	..	..	1
Sarcoma of mesenteric glands	..	..	1	..	..	1
Hernia—51.						
Inguinal, indirect	7	..	..	..	..	7
" infantile	1	..	..	..	..	1
" congenital	2	..	..	..	..	2
" irreducible	..	1	..	..	1	1
" direct	1	1	..	..	..	2
" recurrent	..	..	1	..	1	1
" indirect, double	13	..	..	..	..	13
" congenital, undescended testis	3	..	..	..	..	3
" " hydrocele	2	..	..	..	..	2
" with cystocele	1	..	..	..	..	1
" interstitial	1	..	..	..	..	1
" congenital, strangulated	1	..	..	..	..	1
" strangulated	1	..	..	..	..	1
Femoral, reducible	3	..	..	..	..	3
" irreducible	5	..	..	..	..	5
" strangulated	1	..	..	1	..	2
Umbilical, incarcerated; omental abscess	1	..	..	..	..	1
" strangulated	1	..	..	..	..	1
Ventral	1	..	..	..	..	1
" incarcerated	1	..	..	..	..	1
Epigastric	..	..	1	..	1	1
Kidney—16.						
Chronic nephritis	1	..	..	..	..	1
" " septicemia	..	..	..	1	..	1
Calculous disease	2	..	..	..	..	2
Pyonephrosis; staphylococcemia	..	..	..	1	..	1
" tuberculous	..	1	..	..	..	1
Pyelonephritis	1	1	..	..	1	2
Hypernephroma	1	..	..	2	..	3
Nephralgia	1	..	..	..	1	1
Renal colic	1	..	..	..	1	1
Perinephritic abscess	3	..	..	..	..	3

	Cured.	Improved.	Unimproved.	Died	No operation	Total.
Bladder—6.						
Calculus	2	..	..	..	..	2
Foreign body in	1	..	..	..	..	1
Fistula	..	1	..	..	..	1
Chronic cystitis	..	1	..	..	..	1
Retention of urine	..	1	..	..	..	1
Prostate—12.						
Abscess of	1	..	..	..	..	1
Hypertrophy of	6	..	1	1	1	8
Carcinoma of	..	..	..	1	..	1
Prostatitis, acute	..	1	1	..	11	2
Penis and Urethra—11.						
Gonorrhea	..	1	1	..	2	2
Posterior urethritis	1	..	..	..	1	1
Phimosis	1	..	..	..	..	1
Epispadias	..	1	..	..	..	1
Hypospadias	..	2	..	..	1	2
Stricture of urethra	2	..	..	..	..	2
Seminal vesiculitis	1	1	..	..	2	2
Scrotum and Testis—16.						
Hydrocele	1	..	..	..	..	1
Varicocele	5	..	2	..	2	7
Congenital hydrocele of cord	1	..	..	..	..	1
Tuberculous epididymitis	..	..	1	..	1	1
Torsion of spermatic cord	1	..	..	..	..	1
Undescended testis	3	..	..	..	..	3
Abscess of "	1	..	..	..	..	1
Sarcoma " "	..	..	..	1	..	1
Female Genitals—13.						
Endometritis	2	..	..	..	..	2
Carcinoma of cervix	..	1	..	1	..	2
Pelvic peritonitis	1	..	..	..	..	1
Ovarian cyst	1	..	..	..	..	1
" " intraligamentous	2	..	..	..	..	2
" " twisted pedicle	1	..	..	..	..	1
Tubo-ovarian abscess	2	..	..	..	..	2
Fibromata uteri; intraligamentous ovarian cyst	1	..	..	..	..	1
Epithelioma of perineum	1	..	..	..	..	1
Rectum and Anus—51.						
Proctitis, acute	1	..	..	..	1	1
Ischiorectal abscess	5	..	..	..	..	5
Fistula in ano	10	2	..	..	1	12
Fissure	2	..	..	..	..	2
Hemorrhoids	20	..	..	..	..	20
Imperforate anus	..	..	..	1	..	1
Papillomatous proctitis	..	1	..	..	..	1

	Cured.	Improved.	Unimproved.	Died.	No operation.	Total.
Rectum and Anus—*Continued.*						
Prolapse of rectum	4	..	..	..	1	4
Papilloma "	1	..	..	..	..	1
Carcinoma "	1	1	1	1	1	4
Lower Extremity—73.						
Pelvis—4.						
Osteomyelitis of ilium	2	..	..	..	..	2
" " os innominatum	1	..	..	..	..	1
Compound fracture of pelvis	..	..	..	1	..	1
Groin—4.						
Sinus	1	..	..	..	..	1
Infected wound	1	..	..	..	..	1
Abscess	2	..	..	..	..	2
Hip—3.						
Osteomyelitis	1	..	..	..	..	1
Synovitis after dislocation	1	..	..	..	1	1
Arthritis, tuberculous	1	..	..	..	..	1
Thigh—21						
Femur, fracture	2	..	..	..	2	2
" neck, fracture	2	..	..	..	2	2
Deformity after "	1	..	1	..	1	2
Osteomyelitis	2	..	..	..	..	2
" of femur and os innominatum	..	..	..	1	..	1
Thigh, abscess	3	..	..	..	..	3
" sinus after osteomyelitis	..	..	1	..	1	1
" hematoma	1	..	..	..	1	1
" burns	2	..	..	..	2	2
" diffuse lipoma	1	..	..	..	..	1
" foreign body in	1	..	..	..	..	1
Sarcoma of femur	1	..	..	..	..	1
" " fascia lata	2	..	..	..	..	2
Patella—2.						
Fracture, comminuted	..	1	..	..	1	1
Prepatellar bursitis, infected	1	..	..	..	..	1
Knee—6.						
Genu varum	1	..	..	..	..	1
Genu valgum	1	..	1	..	1	2
Acute synovitis	..	1	..	..	..	1
Tuberculous arthritis	1	..	..	..	..	1
Wound of	..	1	..	..	1	1
Leg—13.						
Cellulitis	1	..	..	..	..	1
Contusion	1	..	..	..	1	1

	Cured.	Improved.	Unimproved.	Died.	No operation.	Total.
Leg—*Continued.*						
Varicose veins	1					1
Ulcer, varicose		1			1	1
" tuberculous	1					1
Gangrene	2			1	1	3
" embolic				1		1
Tibia, osteomyelitis of	3					3
" fracture of, and fibula	1				1	1
Foot—20.						
Hallux valgus	1					1
Talipes equinovarus	1					1
Foot, cellulitis of	4					4
" diabetic gangrene of				3		3
" arteriosclerotic gangrene of	2					2
Heel, diabetic gangrene of	1					1
" ulcer of	1	1			1	2
Toe, gangrene of	3					3
Metatarsal joint, suppurative arthritis of	1					1
" bone, osteomyelitis of	1					1
Fracture of ossa calcanea	1					1
Miscellaneous—30.						
Post-operative adhesions	1				1	1
Burns of body	1			1	2	2
Carcinomatosis				1		1
Constipation	4				4	4
Enterocolitis	2				2	2
Furunculosis	1	1			1	2
Intestinal autointoxication	1				1	1
Influenza	1				1	1
Lumbar abscess	2	1				3
Enlarged liver		1			1	1
Neurasthenia			1		1	1
Psoas abscess			1		1	1
Pemphigus neonatorum				1	1	1
Painter's colic		1			1	1
Pneumonia, lobar	1	1			1	2
Streptococcemia	1			2	2	1
Tertiary syphilis		1	1		2	2
Traumatic tetanus				1	1	1
Suppurating cyst of urachus	1					1

REPORT ON THE OPERATIONS PERFORMED IN THE SECOND SURGICAL DIVISION.

Operations, 598; Deaths, 63.

OPERATIONS ON CRANIUM AND ITS CONTENTS. TOTAL, 5; 1 DEATH.

	Totals.	Deaths.
Incision and drainage for contusion of skull	1	..
Craniotomy for depressed fracture of skull	1	..
" " abscess of brain	1	1
" " compression of brain	1	..
" " fracture of base of skull	1	..

We believe that in fractures of the skull one of the chief sources of danger is the pressure upon the brain by exudate, blood serum, or both, exercised through the fractured area. A simple hematoma under the scalp cannot exert harmful pressure so long as the bone is intact. If there is a fracture completely through the skull, however, this extra-cranial pressure becomes transmitted and dangerous symptoms often occur. A simple incision, if the dura has not been lacerated, may be all that is required to give relief, although in many instances the removal of bone may also be required, either to raise a depressed portion or to explore a dura which is under suspicion.

Abscess of Brain; Craniotomy; Death.—Julius Z., 53 years old, admitted April 28, 1902. Three weeks before admission paresthesia of the lips and finger tips had been noticed. There had been severe headaches, starting in the right auricular region, together with vomiting. At first sensibility, later power in the left arm and leg, had diminished. Sensorium had been clouded at times. The tongue deviated to the left. There was internal squint of the right eye. The left side of the face was flattened. There was *tâche cérébrale*. The knee jerks were increased on the left side. Kernig's sign was present. There was left hemianesthesia, including the face. May 3, stuporous during the night; temperature normal, pulse slow; eyes and ears were found normal. On May 8 patient was more stuporous and the breathing was more stertorous. By May 15 he had grown more stuporous and an optic neuritis had developed; temperature 102°, pulse 76. On May 18 the skull was opened. An elliptical skin and bone flap was made, exposing Rolando's fissure and the anterior and posterior ascending parietal convolutions. The dura was thickened and very tense. It was incised, and the brain substance protruded into the wound. The brain was aspirated in all directions, with negative results. A piece of brain tissue was removed for examination. The wound in the dura was sutured with catgut and the skin with silk. A rubber tissue drain was led down to the dura. The patient was unconscious after operation and died about twenty-four hours later.

The diagnosis was made on the symptoms alone. It is admitted that this may be erroneous, but it is unavoidable since no autopsy was permitted.

Compound Depressed Fracture of Skull; Craniotomy; Cure.—Joseph R., 27 years old, admitted August 9, 1902. Twenty-four hours before admission the patient had been thrown from a car and struck his head. He had been told that he had a depressed compound fracture of the skull. Examination on August 9, 9 A.M. Patient had spent a restless night. He was perfectly conscious. The pulse was 66 and irregular. The right pupil was larger than the left and reacted more sluggishly to light. There was no vomiting and no headache. At 5 P.M. examination showed that he was not able to close the right eye as well as the left. Operation August 9, at 8 P.M. A U-shaped incision was made around the wound in the scalp in the left frontal and parietal region. The fracture was found to consist of three transverse fissures extending through both tables of the skull. The entire fractured area was depressed about a quarter of an inch. With a gouge the anterior border of the depressed area was removed, thus facilitating the introduction of an elevator with which the fragments of the outer table were, one by one, removed. It was then seen that there was a fracture of the inner table, likewise depressed, extending further forward than the fracture of the outer table. With the rongeur the outer table was further removed. It was then possible, with an elevator, to remove the depressed portion of the inner table piece by piece. At the posterior portion of the wound there were two lacerations of the dura mater. Small packings were introduced at this point and the wound closed with silk sutures. Recovery was uneventful and the patient was discharged, with a sinus about three-quarters of an inch long, on August 30.

Fracture of Base of Skull; Craniotomy; Cure.—Thomas McG., 6 years old, admitted November 4, 1902. A few hours before admission the boy had fallen about eight feet, striking on the left side of his head. He remained conscious for half an hour, when he vomited a small amount of blood, after which he became unconscious. There had been bleeding from the nose and an escape of much watery blood from the ear. On admission the boy was conscious, but rapidly became more and more stuporous; the pulse became slower and slower, respiration stertorous. The pupils were equal and reacted to light; there was slight convergent strabismus. After shaving the head a swelling was noticed over the left mastoid and occipital regions. There was profuse bleeding from the left ear, and some bleeding from the mouth. The scalp was immediately opened by a curved incision above the left ear. The squamo-occipital and lambdoid sutures were found separated for a distance of about an eighth of an inch, and running upward into the parietal bone and backward into the occipital were two long, ragged lines of fracture. There was also a short

fissure in the squamous portion of the temporal bone. The underlying brain was tense and bulging and did not pulsate. A large section of the squamous plate of the temporal bone was gouged away, as was also a section of the parietal. The exposed dura was tense and bulged into the wound. A minute puncture of the dura released a small quantity of cloudy fluid; the brain then pulsated freely. A large venous channel, possibly the lateral sinus, was punctured and considerable blood allowed to escape. During the operation the patient's condition steadily improved. The pulse, which before operation was 58, gradually crept up to 90. Gauze drain led down to the exposed dura, and suture of the wound with silk. It is believed that improvement was probably due to relief of pressure by incision into the rapidly increasing hematoma under the scalp, which must have exerted pressure on the dura through the wide fissures. Cerebral contusion was probably relieved by the punctures. On the following day the boy was rational and bright. He vomited a few times. On November 6 the boy was bright and cheerful. On November 13 the stitches were removed and the wound found in good condition. Recovery was uneventful, and the boy left the hospital with a small superficial wound on November 27. (*Note*—January 1, 1903: The boy has remained well.)

Compression of Brain; Craniotomy; Cure.—Gustav L., 41 years old, admitted February 25, 1902. The patient had been admitted to another hospital on February 3, at 8 P.M. He had then been in a semi-conscious condition and had had two slight scalp wounds. The pupils had been slightly unequal and moderately dilated. He had complained of great pain in the head, and had vomited shortly after he had been admitted. He was said to have been struck in the head by a trolley car. Patient had been put under bromide treatment and had remained in a semi-conscious condition for three or four days. He then began to show symptoms of meningitis, photophobia, conjunctivitis, and frontal headache. At the end of a week the patient was fairly rational and the temperature, which had been as high as 101°, became normal. The patient had then left that institution. On February 25 his general condition was good, his pupils moderately contracted and reacted to light and accommodation. There was slight facial paresis on the right side. There was slight weakness of the upper and lower right extremities. There was slight cervical rigidity. Hearing in the left ear was diminished. Knee jerks were present, but less active than normal. There was a tender swelling over the right temporal region. There was an incised wound three inches long behind the left ear. The eyes were normal. On February 27 power in the right upper extremity was still diminished, likewise the right lower extremity. On March 2 his mentality had improved. On March 16 the mental condition became decidedly worse. He had difficulty in expressing himself and forgot the most common words. He complained of severe headaches. The weakness in the entire right

side was very marked. When the skull was percussed a very sensitive area was found over the site of the old injury on the right side. On March 18 the skull was opened. A crescentic incision was made, with the concavity downward, over the suspected area. The dura mater was exposed by gouging away the overlying bone. No fracture was found. Aspiration of the subdural space yielded clear fluid. Pulsation of brain was not marked. The skin edges were united and a small rubber tissue drain left under the flap. As soon as patient recovered from the anesthesia his mentality was decidedly better. He understood questions more readily and made quicker replies. He said he felt better, and was able to whistle, which he could not do before. On the following day the weakness of the right extremities was less marked. The wound healed by primary union. Patient complained of tinnitus aurium. This persisted up to April 12, when the patient was discharged cured.

OPERATIONS UPON THE FACE, ORAL CAVITY, JAWS, AND NECK.

TOTAL, 37; 2 DEATHS.

	Totals.	Deaths.
Resection of superior maxilla for sarcoma	1	..
Incision of submaxillary abscess	2	..
Excision of external carotid for cancer of cheek	1	..
Extirpation of sarcoma of parotid gland	1	..
Cheiloplasty for harelip	1	..
Incision and drainage of abscess of nose; meningitis	1	1
" " " " " " neck	5	..
Removal of submaxillary calculus	1	..
Incision and drainage of infected ranula	1	..
Partial excision of tongue for epithelioma	1	..
Incision of retropharyngeal abscess	4	..
Excision of tubercular glands of neck	6	..
" " sebaceous cyst of neck	1	..
" " branchiogenetic cyst	2	..
" " thyroglossal cyst	1	..
" " hyoid fistula	1	..
Incision and drainage of congenital fistula of neck	1	..
Enucleation of parenchymatous goitre	1	..
Incision and drainage of thyroid cyst	1	..
Excision of thyroid cyst	2	..
" " sarcoma of neck	1	..
Incision and drainage of submaxillary abscess	1	1

Submaxillary Abscess; Incision; Abscess of Lung; Empyema; Death.—Hannah F., 17 months old, admitted May 8, 1902. The child had been one of twins, had been breast-fed for five months, and had never been previously sick. Two weeks before admission the mother had noticed a small swelling in the left submaxillary region, which had steadily increased in size. On admission, temperature 103°, pulse 134. A two-inch incision below the angle of the jaw evacuated about an ounce of pus. A culture from the pus showed streptococci. On May 14, without discoverable cause, the temperature suddenly rose to 104°. On May 17, in view of the continued high

temperature, an incision at right angles to the original incision was made for better drainage. Dulness and diminished breathing were noticed over the left upper lobe. From May 15 to May 25 the morning temperature was about 101° and the evening temperature between 104° and 105°. On May 25 flatness at base of right lung, with absent breathing; aspiration yielded a clear fluid. On the following day ten ounces of turbid fluid were withdrawn from the right chest. An abscess over the metacarpal bone of the little finger of the left hand was opened on the same day. Streptococci were found in the aspirated fluid. Death occurred on May 29.

The following case illustrates the grave result which may follow an apparently trivial ailment. Probably a free incision early in the disease would have been followed by recovery.

Abscess of Nose; Meningitis; Incision and Drainage; Death.—Daniel V., 75 years old, admitted January 30, 1902. A week before admission a furuncle had developed and the nose had become red and swollen; there had been slight pain and tenderness. Inside of the right nostril, on admission to the hospital, there was a discharging sinus which led to an abscess cavity. On January 31 the abscess was incised and packed with gauze. For six days following operation patient was dull and apathetic. There was some aphasia, irregular loss of power, and resistance to any manipulation or examination. Diagnosis of meningitis was then made. From February 7 the temperature and pulse rose steadily, the patient became weaker and weaker, and he died on February 12. No autopsy.

Parenchymatous Goitre; Enucleation; Cure.—Clara S., 28 years old, admitted September 6, 1902. Three years before admission patient had first noticed pain above the sternum. The pain was intermittent, and not present when swallowing. It had increased in severity. On examination a moderate enlargement of the thyroid gland was made out. On September 19 a transverse curved incision, with the convexity downward, was made just below the prominence of the tumor. The greater part of the mass was removed by blunt dissection, the tumor being friable. A cigarette drain was introduced and the skin closed with silk. The operation had been done under gas and ether. The tumor was about the size of a walnut and was firm in consistence. The patient left the hospital four days after operation, convalescent.

Carcinoma of Cheek; Excision of External Carotid Arteries; Improvement.—Mortimer J., 34 years old, admitted May 29, 1902. About eighteen months before admission an ulcer developed on the inside of the right cheek. The ulcer gradually increased in size and became indurated. Three months before admission a piece of the ulcer had been removed and the pathologist had reported it as non-malignant.

The ulcer then healed, but the induration persisted and it became painful. Two weeks before admission a painful gland was noticed beneath the jaw. The right cheek over the upper as well as the lower jaw was roughened and indurated on the buccal side from the molar teeth to the angle of the jaw. The induration was very firm and involved fully half the thickness of the cheek. In front of the angle of the jaw there was a small, tender mass adherent to the bone. On May 30 a small incision was made on the right side parallel to the angle of the jaw. The submaxillary gland was excised. The facial vein was cut and bled profusely. Dawbarn's operation was then decided upon. The incision was enlarged downward along the anterior border of the sternomastoid. A temporary ligature was placed around the common carotid. The external carotid and its branches were successively ligated and the vessel removed between the ligatures. The facial vein was then exposed again, clamped and tied. The temporary ligature was left *in situ*, the ends of the ligature coming out of the lower angle of the wound. A drain was left at either angle of the wound and the rest of the wound sutured. On June 7 the external carotid was excised on the opposite side. As a result of trauma to the hypoglossal nerve the left half of the tongue was paralyzed and speech and swallowing were interfered with. The patient was discharged from the hospital, improved, eight days after the second operation.

Epithelioma of Tongue; Excision; Cure.—Jean S., 54 years old, admitted June 28, 1902. Patient had had lues thirty years before admission. He had always smoked a great many cigarettes. During the fifteen years prior to admission he frequently had patches in his mouth. Six months before admission he noticed a small lump at the tip of his tongue. It did not increase much in size, and there was very little pain. On the right lateral border of the tongue there was an ulcer with no induration around it. Just below this there was an excrescence of the shape of an almond; no glands could be felt. On June 30 a wedge-shaped excision of the affected portion of the tongue was done. The wound was sutured with silk. It healed promptly and the man left the hospital a week after operation.

Fibro-myxo-sarcoma of Superior Maxilla and Malar Bones; Partial Resection of Bones with Extirpation of Tumor; Cure.—Isidor B., 10 years old, admitted July 11, 1902. During the eight months prior to admission there had been a slight swelling in the right malar region. The swelling was painless and did not interfere with opening the mouth. Six days before admission a doctor prescribed an ointment to be rubbed into the legs. Two days later the jaws became tender. On admission there was no salivation, but a marked fetor of the breath. The boy was able to open his mouth to a limited degree. The right side of the face was swollen, obscuring the outline of the malar bone. On the right side of the mouth there was a swelling ex-

tending from the first molar as far back as the ramus of the jaw. The cervical glands were somewhat enlarged. On July 12 several pieces were removed from the tumor for examination. Operation on July 19 under chloroform. Preliminary ligation of the right external carotid in continuity just at its origin from the common carotid. A few small glands over the vessel were removed for examination. The Dieffenbach incision was then made, extending from the posterior part of the right malar bone beneath the orbit along the side of the nose. The incision was carried down to the bone, the periosteum raised, together with the flap, and turned down. There was only moderate bleeding. The tumor was found to emerge from the antrum of Highmore. It had reached the cheek by perforating the anterior wall of the antrum. It extended upward to the floor of the orbit and backward to the base of the skull. The tumor was adherent to the bone on the floor of the orbit. This portion of bone was removed by dividing the nasal process of the superior maxilla, the floor of the orbit in front of the sphenomaxillary fissure, and the malar bone at its middle. The tumor, which was well encapsulated, was then readily peeled out of the tissues surrounding the antrum. It was peeled from the wall of the nasopharynx by means of one finger in the antrum and another in the mouth. When the attempt was made to free the tumor from its outer and lower attachments, the capsule tore and parts of the mass that were left behind had to be separately removed. At this stage bleeding was free. After a thorough scraping of the entire cavity, the latter was packed with a tampon which was led out of the mouth. The entire face wound was closed. The wound healed by primary union. The cavity left after removal of the drain filled in rapidly and the boy left the hospital on August 13.

Thyroid Cyst; Excision; Cure.—George A., 49 years old, admitted June 24, 1902. Fifteen months before admission there had been difficulty in swallowing solid food, and pain in the chest during deglutition. These symptoms had increased in severity, and there was even difficulty in swallowing fluids. There had been loss in weight of about thirty pounds. There was a mass on the right side of the neck, extending from the middle line to the posterior border of the sternomastoid, and from the angle of the jaw to the clavicle. The mass was hard, movable, and not attached to the skin. It moved on swallowing. There was dulness in the first right interspace and over the upper portion of the sternum. There was tubular breathing and bronchial voice over the dull area. There were similar signs on the left side. The right radial pulse was somewhat larger than the left. An esophageal bougie was readily passed into the stomach. On June 24 an oblique incision five inches long was made over the mass. There was considerable bleeding from large veins. The tumor was easily excised and the bleeding was readily controlled by ligature. A small cigarette drain was left in the upper angle and the skin

sutured with silk. The tumor was about 4 by 3 by 2 inches. On section numerous cysts were found, containing a reddish-brown fluid; the cysts varied in size from a pea to a large hazelnut. Most of the tumor consisted of a network of connective tissue filled with a colloid material. The wound healed by primary union. The pathological finding was hyperplastic struma, with hyaline and calcareous degeneration. The patient left the hospital ten days after operation.

AMPUTATIONS—21; DEATHS, 6. *(See headings,* LOWER EXTREMITY *and* UPPER EXTREMITY.)

	Totals.	Deaths.
Hip, for chronic osteomyelitis of femur	1	1
Thigh, diabetic gangrene	2	2
" arteriosclerotic gangrene	2	1
" Reynaud's disease	1	1
" embolic gangrene of foot	1	
" sarcoma	1	..
Leg, diabetic gangrene of foot	1	1
" gangrenous cellulitis	1	..
" Reynaud's disease	1	..
Reamputation	2	..
Toe, osteomyelitis	3	..
" arteriosclerotic gangrene	1	..
Forearm, cellulitis	1	..
Finger	3	..

OSTEOTOMY—8.

Humerus, refracture for malunion	1	..
Ulna, lack of growth of radius	1	..
Femur, malunion and deformity	1	..
Tibia, genu varum	2	..
" " valgum	2	..
Metatarsus, hallux valgus	1	..

OSTEOMYELITIS. TOTAL, 33; DEATH, 1.

	Totals.	No operation.	Deaths.
Inferior maxilla	11	1	..
Clavicle	1	..	..
Rib	1	..	..
Rib and sternum	1	..	..
Humerus	2	1	1
Phalanges	2	..	..
Mastoiditis	2	..	..
Femur	4	..	..
Tibia	4	..	..
Tarsus	1	..	..
Sacrum	1	..	..
Ilium	2	..	..
Pubic bones	1	..	..

Acute Osteomyelitis of Humerus; Sepsis; Osteotomy; Death.—Louis R., 11 years old, admitted May 7, 1902. Five days before admission the boy had had a fall. This was followed by pain in the left arm. On the following day general malaise and severe headache. On

the third day increased severity of symptoms, accompanied by a chill. Patient was delirious on admission and in very poor condition. Temperature 105.4°, pulse 138. The left arm was swollen and edematous. Incision made over outer aspect of humerus. Under the periosteum a moderate amount of thin, brownish pus was found. On opening the medullary cavity similar pus was found. After scraping and irrigating, the cavity was drained with tubes. The delirium continued, the temperature remained high, and the patient died forty-eight hours after operation.

Chronic Osteomyelitis of Ribs; Tuberculosis of Sternum; Osteotomy; Plastic Operations; Cure.—Samuel H., 26 years old, admitted November 6, 1901. The family history was negative. With the exception of typhoid fever, patient had always been well. Nine months before admission two small abscesses had opened over the sternum. In August, 1901, resection of ribs and part of sternum had been performed at another hospital A sinus had persisted and a new focus to the left of the sternum had appeared. Shortly before his admission patient began to cough and expectorate considerable mucus. On admission there was a sinus leading down to the second rib, and another sinus leading down to the sternum. Operation on November 9. The middle third of the sternum, as well as the fourth and fifth costal cartilages on both sides, were removed. The posterior surface of the sternum formed the anterior wall of an abscess cavity, of which the posterior wall was formed by the anterior surface of the pericardium. On December 10 the wound was revised. Part of the sixth costal cartilage and more of the sternum were removed. On January 21 the sinuses were curetted under anesthesia. On February 11 a plastic operation was done to cover the large granulating area. The man was finally discharged on March 29, 1902, with two small sinuses.

OPERATIONS ON THE JOINTS—10; NO DEATHS.

Resections.

	Totals.
Elbow, for tuberculosis	1
Knee, " "	2
Hip, for osteomyelitis of femur	1

Incision and Drainage.

Elbow, for tuberculous sinus	1
" " tuberculosis	2
Knee, for suppurative arthritis	1
Calcaneo-astragaloid joint, tuberculosis	1
For sacroiliac tuberculosis	1

OPERATIONS ON THE TENDONS AND BURSÆ—3; NO DEATHS.

Tendon transplantation for pes equinus	1
" suture for division after trauma	1
Incision and drainage of prepatellar bursitis	1

OPERATIONS ON CHEST WALL. TOTAL, 4; 1 DEATH.

	Totals.	Deaths.
Thoracoplasty for persistent sinus	2	..
Thoracotomy for empyema	1	..
" " pyopneumothorax	1	1

Pyopneumothorax; Resection of Rib; Death.—Lena S., admitted July 5, 1902. Six months before admission patient noticed that her feet were swollen, and she began to complain of dyspnea on exertion. She remained up for about three months and then had to go to bed. In May she had fluid taken from her right chest, and since then fluid had been withdrawn three times, the last time on June 30. The fluid had always been clear until the last tapping, when it was cloudy. A tube had been inserted into the chest, from which there had been a constant discharge, which had become purulent. Breathing was absent over the right chest anteriorly. There was bronchovesicular breathing at the left apex, and bronchial in the left axilla. There was dulness from the right apex posteriorly down to the angle of the scapula. From there down there was flatness. There was also flatness over the left base posteriorly. The wound in the right chest discharged foul pus. There was subcutaneous emphysema. There was a systolic murmur at the apex of the heart. There was a marked nephritis. On July 12, 2½ inches of the eighth rib was excised under local anesthesia. Considerable foul fluid and necrotic material was evacuated; the cavity was swabbed with peroxide of hydrogen and drainage tubes introduced. The patient remained in about the same condition until July 15. On that day, during the change of the dressing, she suddenly died. There was no autopsy.

OPERATIONS ON THE BREAST. TOTAL, 6.

	Totals.
Carcinoma, amputation	3
Fibroadenoma, excision	1
Fibroma, excision	1
Mastitis, bilateral, incision and drainage	1

In carcinoma of the breast the complete operation was always performed, both pectorals being removed with the mamma and axillary contents in one mass. The incision was made high on the shoulder to avoid axillary contracture. The supraclavicular incision was not made in every case.

GALL BLADDER AND GALL DUCTS—29; 4 DEATHS.

	Totals.	Deaths.
Cholecystotomy and drainage	5	1
" " choledochotomy	1	1
" " suture	1	..
Cholecystectomy	17	..
" secondary	3	2
" and choledochotomy	3	2
Choledochotomy and suture	1	..

In operating upon the gall bladder and its associated ducts, the incision of choice ran vertically between the fibres of the right rectus muscle.

Choledochotomy is believed, on the whole, to be the most dangerous of these operations, while primary cholecystectomy, even in desperate cases, seems to be safe, and cholecystectomy combined with choledochotomy does not seem to add to the dangers of the operation. This latter conclusion has been arrived at not only on the evidence of the cases here presented, but from a number of others which we have had up to the time of going to press (April, 1903). The full technique, together with further conclusions, will form the subject of a later report.

Choldithiasis; Cholecystitis; Cholecystectomy (Secondary); Death.—Rosie J., 39 years old, had been discharged from the hospital on September 27, 1901, with a sinus discharging a thin, colorless fluid, following an operation for empyema of the gall bladder. The patient was readmitted on January 29, 1902. Shortly before patient began to have recurrent attacks of epigastric pain, accompanied by chills and vomiting. There was moderate jaundice, and the urine was scanty and contained a few casts. There was a sinus at the upper portion of the scar of the former operation, about eight centimetres deep, at the bottom of which a slight grating could be felt. At the site of the lower part of the scar there was a hernia. Operation on February 2, 1902. The opening of the sinus was closed with a purse-string suture, and an incision made through the former scar. The sinus was found to run into the gall bladder, which had merely been drained at the former operation. There were firm adhesions around the gall bladder, and deep down in the common duct a stone was felt. Considerable hemorrhage attended the freeing of the gall bladder, and several sutures were applied to the raw surface of the liver. The cystic duct was ligated and the bladder removed. In cutting down on the common duct before the bladder was removed, considerable bleeding was encountered from omental adhesions. The stone was removed and the duct drained. The abdominal wound was closed. The patient became gradually weaker and died twenty-four hours after operation.

Postmortem examination showed adhesive peritonitis in the upper part of the abdomen, with some free bloody fluid; suppurative cholangitis; small subphrenic abscess on the left side, and contracted kidneys.

Choldithiasis; Gangrenous Cholecystitis; Cholecystectomy; Cure.—Carrie S., 43 years old, admitted October 12, 1902. Four days before admission patient had her first attack of biliary colic, associated with a chill and vomiting. The liver was enlarged, the gall-bladder region tender, and the right rectus rigid. Temperature 103°, pulse 140; leu-

cocytosis, 14,600. On October 14 the abdomen was opened by an incision along the outer border of the right rectus. The gall bladder was adherent, distended, and contained many stones. The bladder was partly emptied by aspiration and the cystic duct clamped off. The gall bladder was then removed. It was found to contain a large number of small stones. The organ was four inches long and its mucosa was gangrenous. Convalescence was uneventful, and the patient left the hospital cured on November 21.

Cholelithiasis; Cholecystitis; Cholecystectomy; Cure.—David R., 50 years old, admitted January 15, 1902. There had been a number of attacks of pain in the right hypochondrium during the nine months prior to operation. The attacks had been of moderate severity, only lasting a few hours. Only in one attack had there been vomiting. For the seven days prior to admission to the hospital there had been constant pain in the right hypochondrium, for the first time radiating to the back. The liver and gall bladder were not to be felt, and there was no jaundice. On January 16 the gall bladder was exposed by an incision through the right rectus. It was found deeply seated and surrounded by vascular adhesions. The adhesions were tied and divided and the entire organ was bluntly dissected out of its peritoneal coat. One large stone in the cystic duct was milked back into the bladder. The cystic duct was ligated with heavy chromic gut and the stump cauterized with pure carbolic acid. A cigarette drain was introduced to the stump of the duct and the rest of the wound closed with layer sutures. Zinc oxide straps were used for the skin. Six large stones were found in the gall bladder. Convalescence was interrupted for a few days by pain in the popliteal space on the left side. This quickly subsided, and the patient was able to leave the hospital with a very shallow sinus twenty-four days after operation. (*Note*—January, 1903: Patient remains well.)

Acute Cholecystitis; Post-operative Adhesions; Cholecystectomy; Secondary Celiotomy; Cure.—Isaac S., 50 years old, admitted May 28, 1902. The man had had two attacks of biliary colic during the two months before his admission. There was marked tenderness in the right hypochondrium and in the epigastrium. No mass was palpable. On June 10 the abdomen was opened and the gall bladder was found to be shrunken, but it contained several stones. An attempt was made to free the bladder, but it was ineffectual and caused considerable hemorrhage. Owing to the stoutness of the patient a transverse incision had to be made at right angles to the vertical one. The bladder was opened and many stones, together with purulent bile, removed. The mucous membrane of the organ was gangrenous. It was decided merely to remove the mucosa, but after this had been accomplished it was found that the entire organ could be removed, and this was accordingly done. Owing to the deep location of the cystic duct a clamp was left on the stump of the duct, and a ligature applied to the

stump besides, to control bleeding in case the clamp should slip. A large cigar drain was applied to the pedicle, the old packings removed and fresh ones inserted, and the wound partly closed with through-and-through chromic catgut sutures. On June 21 the clamp was removed without hemorrhage. Thereafter there was a continuous profuse discharge of bile, together with attacks of pain in the region of the wound, until July 29, when it was decided to again open the abdomen. Incision was made through the old scar, and extensive adhesions of omentum and stomach partly tied off and partly torn through. At the depth of the wound about the site of the stump of the cystic duct a large inflammatory mass was found. Owing to the poor condition of the patient nothing further could be done. A cigar and a gauze drain were introduced to the depth of the wound, and the greater part of the wound closed with through-and-through silk sutures. The sutures became infected and had to be removed early, and there was then a wide, gaping wound. There was a distressing hiccough for several days. Until August 13 there was a profuse biliary discharge. Thereafter the biliary and the wound discharge became steadily less. The large wound granulated slowly, and the patient left the hospital completely recovered on October 15.

Empyema of Gall Bladder; Stones in Cystic Duct; Cholecystectomy; Cysticotomy; Cure.—Sarah W., 25 years old, admitted January 17, 1902. During two months prior to operation patient had had several severe attacks of biliary colic. During the week prior to operation there had been continuous pain and repeated vomiting. There was tenderness and rigidity over the upper part of the right rectus; no mass could be felt. Temperature 102°, pulse 128. Operation January 18, 1902. Incision along outer border of right rectus revealed an enormously distended gall bladder. The cystic duct was also distended so as to form a distinct diverticulum, and contained several stones. Aspiration of the bladder yielded a cloudy, bile-stained fluid. The bladder was removed in the usual way. An incision was then made into the dilated cystic duct and four small stones removed. A cigarette drain was introduced against the under surface of the liver. The wound was closed with layer sutures. Convalescence was uninterrupted, and the patient was discharged cured on February 22.

Cholecystitis; Stone in Common Bile Duct; Cholecystectomy; Choledochotomy; Cure.—Mrs. Eva B., 28 years old, had been discharged from the hospital on May 5, 1902, after a choledochotomy. She had remained perfectly well until June 15, when she had been seized with severe pain in the right hypochondrium. There was no vomiting nor jaundice, but intense itching of the skin. The urine was deep brown in color and contained bile-stained epithelium, red blood cells, and coarsely granular casts. The stools were very light in color. Temperature and pulse were normal, and no mass was to be felt in the

abdomen. On June 17 an incision was made in the line of the scar. Stomach and omentum were found adherent to the scar. The gall bladder was found buried in adhesions; it was extremely small. A stone was felt in the common duct, but it slipped away from the examining finger and its location could not again be ascertained. The common duct was again incised at the site of the former opening, but no stone was found. A probe entered readily in both directions. A drainage tube was introduced through the incision in the common duct into the hepatic duct. There was no free flow of bile. The tube was sutured to the skin. The bladder was then removed in the usual way and the abdomen closed. There was a profuse acid discharge from the wound for two days. Methylene blue given by mouth appeared in the wound in three minutes. After a few days the discharge in the wound was alkaline and biliary in character, while that from the tube was a little bile-tinged and contained combined HCl. There was probably an abnormal opening into the stomach through the old cicatrix in the common duct, which was adherent to the stomach. On June 22 the stomach contents no longer came out of the wound. On June 28 there was a fecal odor to the discharge. On July 11 the sinus was curetted. Thereafter the discharge became less, and the patient left the hospital with a very small sinus on July 16. *(Note*—January, 1903: The wound closed soon after the patient left, and she has remained perfectly well ever since.

Cholelithiasis; Cholecystitis; Choledochotomy and Suture; Cholecystotomy and Drainage; Death.—Sarah B., 52 years old, admitted November 17, 1902, had been having attacks of gallstone colic for twelve years. Six years before admission, had had first attack of jaundice. After this attack thirty stones had been passed, and patient was free from pain for four years. During the year previous to operation there had been several severe attacks. Jaundice had been present five months when patient was admitted to the hospital. During this time there had been chills accompanied by fever, and other symptoms of cholangitis. The liver was palpable one and a half inches below the free border of the ribs. On November 21 an incision was made through the rectus muscle. The gall bladder was shrunken and contained a single stone. In the common duct two stones were felt. The stones were removed from the duct and the opening sutured. The gall bladder was then opened and the stone removed therefrom. The mucous membrane was swabbed with pure carbolic acid and a drain introduced. The rest of the abdominal wound was sutured. About three hours after operation patient went into a condition of shock, and died six hours after operation. No autopsy.

Cholelithiasis; Cholecystitis; Cholecystotomy; Secondary Cholecystectomy and Choledochotomy; Death from Cerebral Embolism.—Barbara K., 46 years old, admitted September 19, 1902. There had been an attack of biliary colic fourteen months before admission. One

week before operation patient had a similar attack, with vomiting, jaundice, and clay-colored stools. The liver was enlarged, the gall bladder region tender, and the right rectus rigid. For two days after admission the temperature rose daily to 105° F., the jaundice was more marked and the general condition worse. Operation on September 22, 1902. An incision through the right rectus revealed an enlarged, congested liver and a distended gall bladder. Intestines and omentum were adherent to the gall bladder by recent adhesions. Aspiration of the bladder yielded four ounces of inodorous bile. Several small stones were removed from the bladder and the organ was sutured into the wound. No stones were felt in the ducts. Bile drained freely from the wound, but the jaundice persisted. On September 30 ten stones were removed from the sinus. On October 2 several more stones were removed. On October 6 six more stones were found in the dressings. On October 12 the temperature, which for ten days had not been above 100°, rose to 104.4°, accompanied by a chill. The temperature then dropped to 100° again and remained there until October 20, when it again rose to 103.2° and again there was a chill. Stones were frequently found in the dressings. But the biliary fistula and the jaundice persisted. Accordingly, on November 18, a secondary operation was performed. Two movable stones were felt in the common duct. They were cut down upon and removed. The gall bladder was then removed in the usual manner. The raw surface in the liver was sutured with catgut. The abdomen was closed by layer sutures. Patient stood the operation fairly well, although the pulse needed considerable stimulation at the end. On the following evening, after a convulsion lasting about a minute, the patient died. In the absence of an autopsy the cause of death was taken to be a cerebral embolus.

Cholelithiasis; Empyema of Gall Bladder; Peritonitis; Cholecystotomy; Death.—Fanny B., 29 years old, admitted April 6, 1902. Patient had had several mild attacks of pain in the upper part of the abdomen, slight jaundice, and constipation. Four days before admission she was seized with violent epigastric pain accompanied by nausea. Slight jaundice developed and persisted. The pain increased in severity and constipation became marked. Pulse 134, temperature 103.6°. Immediate operation was undertaken under local anesthesia. Owing to the extreme rigidity of the abdominal muscles palpation was negative. On opening the abdomen through the right rectus muscle, free turbid fluid escaped from the peritoneal cavity. The liver was found enlarged, and the gall bladder much distended. Four and a half ounces of cloudy, foul-smelling fluid were withdrawn by aspiration. The bladder was then opened and thirty-eight stones were removed. The bladder was sutured to the peritoneum and two tubes introduced. The lower end of the wound was sutured. On the following morning the temperature had dropped to 101° F. and the pulse to 120. In the evening she became restless and vomited

frequently. During the night she got out of bed and was very unruly. On the following morning she went into collapse and died forty-five hours after operation. No autopsy.

Stone in Common Duct; Choledochotomy; Cure.—Mrs. Eva B., 28 years old, admitted April 11, 1902. During the eight months prior to operation patient had had six attacks of biliary colic accompanied by vomiting and jaundice. Two weeks before admission a severe attack was ushered in with pain in the right hypochondrium, radiating to the shoulder. There was vomiting and jaundice, the latter persisting up to the time of operation. Patient had lost thirty-five pounds in weight. The liver could be felt below the free border of the ribs, but the gall bladder could not be palpated. On April 12 the abdomen was opened by an incision through the right rectus. The gall bladder was markedly contracted, and in the common duct a movable stone was felt. An incision was made into the duct between two silk Lembert sutures and the stone removed. The sutures were then tied, thus closing the opening in the duct. A drain was introduced down to the sutured duct. The wound was closed with layer sutures, and adhesive straps for the skin. Convalescence was rapid, and the patient was able to leave the hospital on May 5.

LIVER—13; 6 DEATHS.

	Totals.	Deaths.
Abscess of liver; incision and drainage	6	1
Multiple abscesses; incision and drainage	1	1
" " and portal phlebitis	1	1
Abscess of liver; exploratory celiotomy	1	1
Suppurating gumma; incision and drainage	1	..
Cholangitis; exploratory celiotomy	1	1
Cirrhosis of the liver; epiplopexy	1	1
Carcinoma of liver and omentum	1	..

The incision of choice in right-sided hepatic abscess of considerable size has been the posterior one, transdiaphragmatic but not transpleural, the pleura being pushed up out of the way. Our results have been most satisfactory in this trying class of cases.

Abscess of Liver; Incision and Drainage; Death.—Jacob S., 29 years old, admitted June 14, 1902. The man had had a colitis of fifteen months' duration. For three months before admission he had had pain in the right hypochondrium, radiating to the back. The liver reached two inches below the free border of the ribs. Temperature 102.8°, pulse 128. On aspiration in the tenth space pus was obtained. On June 14 an incision was made parallel to the eleventh rib. Three inches of the rib were resected and the pleura

stripped back. The liver was exposed through a longitudinal slit in the diaphragm. The liver was aspirated and pus obtained deep down. A grooved director and dressing forceps were then introduced and about four ounces of pus evacuated. Numerous small abscesses were found communicating with the main abscess. A drainage tube was inserted and a dry dressing applied. On the following day the general condition, in spite of free stimulation, was poor. On the second day after operation the patient suddenly died. No autopsy.

Abscess of Liver; Exploratory Celiotomy; Death.—David C., 23 years old, admitted December 23, 1901. Five days before admission the man had been seized with severe pain in the epigastrium accompanied by vomiting. On the day after the onset there had been a chill. The general condition was poor. There was slight icterus and distinct peritoneal facies. Pulse 130, temperature 104.8°. The liver was somewhat enlarged downward. The abdomen was very rigid, especially the upper part of the right rectus. An exploratory incision along the upper part of the right rectus was made at once. The liver was congested and extended two inches below the free border of the ribs. It was aspirated several times, but only blood withdrawn. The gall bladder and appendix were normal. The spleen was a little enlarged. Pancreas and stomach were normal. The right kidney was larger than the left. The peritoneum of the entire right side of the abdomen was congested. Flakes of fibrin were seen on the lesser omentum. Owing to the poor condition of the patient further interference was contraindicated. The wound was closed with silk sutures. On the following day the abdomen was opened on the left side. The intestines were congested and distended. An aspirating needle was introduced into the large intestine and gas allowed to escape. This was also done in several parts of the small intestine. A small incision was made in the intestine and subsequently sutured. The patient's condition was too poor to justify further procedure, and the wound was closed. Death took place on the following day. Autopsy revealed an abscess containing about two ounces of pus in the most posterior portion of the right lobe of the liver.

Multiple Abscesses of the Liver; Incision and Drainage; Death.—Julius W., 43 years old, admitted August 31, 1902. Patient gave a history of attacks of malaria and diarrhea. Two weeks before admission he had had an attack of diarrhea, which was followed by vomiting and fever. The liver reached two inches below the free border of the ribs. The spleen was palpable. There was tenderness over the liver. Leucocytosis, 14,400; Widal negative. Temperature 103.6°, pulse 100, respiration 24. The urine contained a trace of albumin and a trace of bile. There was some conjunctival icterus. On August 31 the abdomen was opened by a median incision. The left lobe of the liver was much enlarged and soft. Aspiration yielded thick, yellow, inodorous pus. The pus cavity was packed with gauze.

Aspiration of the right lobe also yielded pus. It was then decided to make an incision in the right flank and drain the right lobe. This was done by resecting part of the tenth rib; the incision was transperitoneal. A small abscess was opened and drained. The man gradually lost ground and died three days after operation. At the autopsy a large abscess was found in the upper part of the left lobe of the liver. In the right lobe there was a smaller abscess. In the cecum and ascending colon there were several superficial ulcers.

Suppurative Portal Phlebitis; Multiple Abscesses of Liver; Incision and Drainage; Death.—Foster R., 40 years old, admitted August 20, 1902. Four weeks before admission the man had been operated on for gangrenous appendicitis and an abscess. The appendix had been removed. Following this operation there had been frequent chills with fever, sweating, and loss of flesh and strength. The general condition was poor and there was conjunctival icterus. The liver was tender and much enlarged. The spleen was also enlarged. There was a profuse purulent discharge from the appendicitis wound. Aspiration of the liver through the ninth interspace in the axillary line yielded thick, reddish pus. The ninth and tenth ribs were resected in the axillary line, whereby the pleura was injured. As the patient's condition was poor, the pleura was opened widely, packings were introduced; and, as aspiration through the pleura had yielded pus, a grooved director was inserted and an attempt made to open the abscess. The patient went into collapse and the operation had to be stopped. Seven hours later the man died. Autopsy showed suppurating phlebitis in the mesentery; suppurative portal phlebitis; multiple abscesses of the liver.

Abscess of Liver; Incision; Cure.—Samuel F., 16 years old, admitted March 29, 1902. Five weeks before admission patient had begun to cough and expectorate. He had lost in weight, had daily chilly feelings, and had to go to bed. There had been pain in the right hypochondrium, radiating into the shoulder. During the three days prior to admission there had been severe hiccough. The liver was a little enlarged downward. Aspiration in the ninth interspace in the post-axillary line yielded pus. Temperature 101°, pulse 116. On March 29 the patient was transferred from the medical side and operation was at once performed. A longitudinal incision was made over the eleventh rib in the post-axillary line and portions of the eleventh and twelfth ribs were resected. The pleural reflection was stripped back into the upper part of the wound and the abscess opened through the diaphragm. A large quantity of yellow, odorless pus was evacuated, and two rubber tubes inserted. During the week following operation there were two small hemorrhages, which were readily controlled by packing. Thereafter convalescence was uninterrupted, and patient was able to leave the hospital on May 16 with a small sinus about three inches deep.

Suppurating Gumma of Liver; Incision and Drainage; Cure.—Philip W., 39 years old, admitted December 22, 1901. There had been several attacks of pain in the region of the liver during the three years prior to operation. Two weeks before admission patient was seized with severe pain in the right hypochondrium. There was neither vomiting nor jaundice. Deep breathing caused pain, as did also any motion forward or backward of the trunk from the waist up. The latter symptom had existed for several months. There was some tenderness over the liver, but no marked enlargement. On December 24 an exploratory incision was made through the right rectus. There were a few adhesions around the gall bladder. The ducts were normal. On the anterior surface of the right lobe there was found a hard, grayish-white mass as large as a hickory-nut. On incising it a necrotic area was found at its centre. A drain was introduced, after thorough curetting, and the rest of the wound closed. The pain had evidently been due to inflammatory adhesions between the liver and the parietal peritoneum. The patient received mercurial inunctions and was given KI and Fowler's solution. The wound healed rapidly, and the man left the hospital on January 16. (*Note*—January, 1903: The patient is perfectly well.)

Cholangitis; Exploratory Celiotomy; Death.—Leon G., 47 years old, admitted July 31, 1902. During five months prior to admission the man had had several attacks of biliary colic. Ten days before admission he had had an attack accompanied by chills, vomiting, and icterus. Temperature 103.8°, pulse 110. The liver was neither enlarged nor tender. The abdomen was rigid in the epigastrium and left hypochondrium. On July 31 an exploratory celiotomy was done along the right rectus. Considerable bloody fluid and some blood clots escaped. The liver was found rotated so that the falciform ligament pointed from left and above to the right and downward. Colon and stomach were adherent to the liver. Numerous distended gall ducts were seen on the surface of the liver. The patient went into collapse and the wound had to be rapidly closed. Death occurred thirty-six hours later. No autopsy.

Cirrhosis of the Liver; Ascites; Epiplopexy; Death.—Mary C., 24 years old, admitted March 1, 1902. The patient had been married two years and had had two abortions. There had been swelling of the abdomen and edema of the feet for a year prior to admission. The abdomen had steadily increased in size, and there had been progressive loss of flesh and strength. There was a systolic murmur at the apex of the heart. The abdomen was distended with fluid; the girth at the umbilicus was 93 cm. There was edema of the lower extremities. The abdomen was tapped three times and about 250 ounces withdrawn each time, but the fluid rapidly reaccumulated. Epiplopexy on April 12. A three-inch incision was made in the median line above the navel. On opening the peritoneum considerable

fluid was allowed to escape. There was no evidence of a tuberculous peritonitis. The liver felt very hard. The omentum was sewed to the parietal peritoneum with chromic gut. The wound was then closed. An incision three inches long was then made below the umbilicus and a long Chamberlin tube, the lumen of which was packed with gauze, introduced into the pelvis; this was left in place. The patient died on the following day. Autopsy showed an advanced cirrhosis of the liver.

ESOPHAGUS AND STOMACH—5 OPERATIONS; 2 DEATHS.

	Totals.	Deaths.
Gastrostomy for carcinoma of esophagus	1	
Gastroenterostomy for carcinoma of stomach	1	1
Exploratory celiotomy for carcinoma of stomach	1	1
Pylorectomy for carcinoma of stomach	1	
Pyloroplasty, Finney's method	1	

Under this heading some interesting cases are reported. One pyloroplasty by Finney's method demonstrated the value of this form of the operation, and the result left nothing to be desired. A case of exploratory operation followed by death, undoubtedly hastened by such operation, once more exemplifies the saying of Manges that, so far from being uniformly innocent, "exploratory laparotomy may be one of the most dangerous of operations." To be sure, this patient had an incurable cancer, but there is no doubt that the mere handling of such tumors through a laparotomy wound is a serious procedure.

Carcinoma of Esophagus; Gastrostomy under Local Anesthesia; Recovery.—Max R., 65 years old, admitted February 16, 1902. Two months before admission patient had first experienced pain and difficulty in swallowing solid food. For one month before admission there was difficulty in swallowing fluids. Patient was much emaciated. An esophageal bougie was arrested 13½ inches from the teeth. Gastrostomy under eucaine, 4 per cent. Incision three inches long along outer border of left rectus. The stomach was drawn into the wound and sutured to the parietal peritoneum with silk. A tube was inserted through a small opening into the stomach, and fastened with a purse-string suture. The wound was packed with gauze, making a funnel-shaped inversion of the stomach wall. Before the patient left the table he received an intravenous infusion of twenty ounces, and three ounces of milk were injected into the stomach. Convalescence was uninterrupted. Patient got out of bed on the fifth day; he left the hospital, much improved, on March 12.

Carcinoma of Stomach; Anterior Gastroenterostomy; Death.—Marcus G., 50 years old, admitted March 24, 1902. Patient gave

the usual history of a pyloric tumor preceded by a history of chronic gastritis. Patient was transferred from the medical division and operated upon on April 11 under chloroform. A median incision four and a half inches long was made partly above and partly below the umbilicus. The pylorus, the seat of a tumor, was adherent to the liver. There was considerable infiltration of the posterior wall of the stomach. An anterior gastroenterostomy was done with a Murphy button and the line of junction reinforced by two Lembert sutures. The wound was closed without drainage. Two days after operation the patient began to vomit a brown, feculent fluid. The temperature remained normal, but the vomiting continued and the pulse became more and more feeble until the patient's death one week after operation. At autopsy a colloid carcinoma was found in the anterior wall of the stomach. The pylorus did not admit the tip of the little finger. There was a carcinomatous mesenteric lymph node.

Carcinoma of Stomach; Exploratory Celiotomy; Death.—Cecilia S., 42 years old, admitted August 10, 1902. The symptoms were of seven months' duration, during which time there was a loss in weight of twenty-five pounds. A tender mass was felt in the epigastric region. On August 14 exploratory under chloroform. An incision through the left rectus revealed a large tumor in the anterior wall of the stomach. The tumor was adherent to the liver. As there had been no symptoms of pyloric stenosis, no anastomosis was done. The abdomen was closed. The patient became progressively weaker and died three days after the operation. No autopsy.

Carcinoma of Stomach; Pylorectomy; Cure.—Clara W., 29 years old, admitted October 14, 1902. Patient had been married three years, and had had one child sixteen months before her admission. Five and a half months before admission patient began to vomit after eating. The vomitus was not digested and was about a quart at a time. At first the vomiting was three times a day, but later only in the afternoon. There was a loss in weight of about twenty-five pounds. A hard, irregular tumor could be seen and felt in the median line between the ensiform and the umbilicus. The tumor was freely movable. On October 21 pylorectomy and anastomosis in continuity. A median abdominal incision was made. The tumor was found to be in the anterior wall of the stomach and the pylorus. There were a few small glands in the gastrocolic omentum. The greater omentum was tied off with chain ligatures close to the stomach. Next the lesser omentum was tied off. The duodenum was freed and clamped off. The clamp on the stomach was placed three inches away from the tumor, which was then excised between the two clamps. Fully one-third of the entire stomach was removed. The upper half of the stomach wound was closed with heavy silk sutures and an anastomosis made with interrupted silk sutures between the duodenum and the stump of the stomach. The suture line was reinforced by a

continuous silk suture. A thin cigarette drain was introduced at the upper and one at the lower angle of the wound. The rest of the wound was closed. The pathological report was adenocarcinoma. For two days nutrient enemata were given and on the third day peptonized milk by mouth. First dressing on October 27; slight purulent alkaline discharge from upper angle of the wound. On the following day the discharge was acid and more profuse. Patient gained rapidly in flesh and strength, and was able to leave the hospital on November 19. She then had a sinus at the upper angle of the wound three inches long, from which there was a steadily diminishing amount of discharge. (*Note*—February 14, 1903: Patient is well and has gained many pounds.)

Benign Stricture of Pylorus: Pyloroplasty: Finney's Method: Cure. —Mary W., 20 years old, admitted to service of Dr. Manges February 24, 1902. During three years prior to operation there had been epigastric pain after eating. This pain became more severe five weeks before admission, and vomiting then set in. Within three days of her admission patient had two attacks of severe hematemesis. For three weeks after admission patient was fed exclusively on nutrient enemata. During this time there was marked improvement in the general condition. On April 3 the vomiting recurred and hemin crystals were found in the vomitus. Following this there were several attacks of pain and vomiting, and on April 12 there was an attack of severe pain in the epigastrium and right hypochondrium, radiating to the back. A few days later vomiting recurred and icterus was noticed for the first time. A trace of bile was found in the urine. The pain and vomiting continued, and the icterus became more marked, so the case was transferred to the surgical division. On April 26 pyloroplasty was done according to Finney's method. An incision was made in the right hypochondrium through the rectus. Gall bladder and ducts were found normal. The pylorus just admitted the tip of the little finger; nothing else abnormal was found. The pyloroplasty was done with silk Lembert sutures inserted between the stomach and duodenum. When these sutures were tied, stomach and duodenum were united from pylorus to a point about four inches from pylorus. A second row of Lembert mattress sutures was inserted but not tied, this second row being parallel with the first row and about three-quarters of an inch from it. A curved incision, like an inverted U, was then made from a point between the ends to the two rows of sutures into the stomach, thence parallel and between the rows of sutures through the pylorus, and down the duodenum to a point opposite the place of beginning. The first row of sutures was then reinforced by through-and-through sutures fastening stomach securely to gut, and then the second row was tied and reinforced (Finney's operation). A small drain was left in and the abdominal wound sutured. Uneventful recovery. Discharged cured May 17. (*Note*—January, 1903: The patient is well.)

APPENDICITIS. TOTAL, 116; 10 DEATHS.

	Totals.	Deaths.
Celiotomy for chronic non-perforative appendicitis	27	..
" " acute catarrhal appendicitis	13	..
" " " ulcerative "	2	..
" " empyema of appendix	3	..
" " perforative appendicitis, abscess	3	..
" " " " multiple abscesses	1	1
" " gangrenous non-perforative appendicitis	16	..
" " " " " with diffuse peritonitis	4	1
" " gangrenous appendicitis, abscess	17	1
" " " " " with diffuse peritonitis	1	..
" " gangrenous appendicitis with general purulent peritonitis	1	1
" " gangrenous and perforative appendicitis	6	1
" " " " " with abscess	4	1
" " gangrenous and perforative appendicitis and diffuse peritonitis	5	..
" " gangrenous and perforative appendicitis with general peritonitis	1	1
" " gangrenous appendicitis, gangrene of cecum, and general peritonitis	1	1
" " gangrenous appendicitis and intestinal obstruction due to adhesions	1	1
" " appendicitis; abscess; no appendicectomy	9	1
" " " " secondary appendicectomy	1	..

The use of rubber gloves, the shortening of the incision, the closure by suture of the greater part of the wounds in suppurating cases, and the abandonment of attempts to drain by gauze or otherwise the general peritoneal cavity—all these technical points are believed to have been instrumental in the reduction of mortality in this disease, until now the percentage is well below that of the general operative list, which includes all cases operated upon. And this, too, in spite of the fact that at Mount Sinai Hospital we have a very large and very acute appendicitis service. Abscesses, of course, are drained, but not the general abdominal cavity.

The fact that pus is encountered does not dissuade us from reasonable efforts to find and remove the offending viscus.

Thrombosis of the mesentery is regarded as an almost certain indication that the case will terminate fatally.

The comparative freedom from danger of operations in interval or before perforation is exemplified. In these cases—as in most of the others in which the organ is removed—we simply ligate the mesenteriolum and then the appendix, cut the latter off, and disinfect the stump with pure carbolic acid. The little stump is cast off in a few

days, and with it disappear any adhesions which may have formed between the raw surface and neighboring structures.

Acute Perforative Appendicitis; Multiple Abscesses; Appendicectomy; Rectal Drainage; Death.—Rebecca R., 13 years old, admitted December 21, 1901. Two weeks before admission the child had received a blow in the lower part of abdomen. One week later she began to have pain here and vomited once. The bowels had moved daily. The abdomen was lax and no mass was to be felt. Temperature 102°, pulse 128. By rectum a mass could be felt high up. On opening the abdomen a small quantity of cloudy fluid escaped. On separating adhesions along the inner side of the cecum a small quantity of foul pus was found surrounding the appendix, which projected downward to the pelvic brim. The appendix was removed. Another abscess was found in the pelvis. Further exploration revealed several more collections of pus reaching over to the left side of the pelvis. An incision was made through the anterior wall of the rectum and a large gauze drain introduced. A cigarette drain was led down to the stump of the appendix and the upper part of the wound was closed. On the following day the child looked septic; she vomited several times. On the 24th the patient was semi-conscious and was unable to swallow. The abdomen was lax, however, and there were no signs of peritonitis. On December 25 the patient was entirely unconscious. Temperature 105°, pulse 148. Dressings were changed; fetid pus came from the rectal incision. The child remained in stupor and died on the 26th. No autopsy.

Gangrenous, Perforative Appendicitis; Appendicectomy; Death.—Sophie W., 8 years old, admitted November 15, 1902. Two weeks before admission the child had been seized with pain in the right iliac fossa, which had persisted. The bowels had moved regularly, and there had been no vomiting. The abdomen was lax but tympanitic. No mass was to be felt. Temperature 101.6°, pulse 140. The abdomen was opened through the usual rectus incision. The necrotic appendix was found running upward behind the cecum, which was bound down by dense adhesions. The base of the appendix had sloughed away from the cecum. The opening was closed with three layers of silk sutures. A cigarette drain was introduced into the retrocecal space and the wound closed. Following the operation there were no signs of peritonitis. The pulse became more and more rapid and feeble, and death took place three days afterward. No autopsy.

Gangrenous Appendicitis; General Purulent Peritonitis; Appendicectomy; Death.—Jacob S., 11 years old, admitted July 29, 1902. Thirty-six hours before admission the boy had been seized with general abdominal pain, followed by frequent vomiting. The bowels had been moved by enemata. The abdomen was very rigid and extremely tender in the right iliac fossa. There was dulness in both flanks.

Temperature 102.8°, pulse 135. On opening the abdomen there was an escape of purulent fluid. The intestines were injected and adherent. The pelvis was filled with pus. The appendix, which was gangrenous, was removed, and pus sponged out of the pelvis and other parts of the abdomen. A cigarette drain was introduced to the stump of the appendix and the wound closed. On the following day the boy was deeply jaundiced. Signs of general peritonitis persisted, and the boy died two days after operation. No autopsy.

Acute Gangrenous Appendicitis; Diffuse Purulent Peritonitis; Appendicectomy; No Peritoneal Drainage; Recovery.—Sarah S., 10 years old, admitted December 9, 1901. The child had had no previous attacks. Two days before admission she had been seized with general abdominal pain, which soon became localized to the right iliac fossa. She had had a chill and vomited several times. The bowels were constipated. The abdomen was rigid, especially on the right side, and there was marked tenderness in the right iliac fossa. The abdomen was opened through a one-and-a-half-inch rectus incision. On incising the peritoneum a large amount of purulent fluid escaped. There were no adhesions. The appendix was two and a half inches long, perforated near its tip, its mucous membrane gangrenous in patches. In the pelvis there was also considerable purulent fluid, which was sponged dry. The stump of the appendix was brought out of the abdomen and sutured to the fascia. A rubber tissue drain was introduced down to the stump of the appendix, but no peritoneal drainage was employed, neither was there any flushing of the peritoneal cavity attempted. At the time of operation the child's condition was not good. Temperature 103.8°, pulse 124. Following the operation there were no untoward symptoms referable to the peritoneum. A fecal fistula, however, developed. On January 4 this was easily closed by a few sutures, and the child was discharged from the hospital, with the wound completely closed, on January 15.

A point of interest in the case is that, in spite of the fact that the appendix was perforated and that there was a diffuse peritonitis present, no drainage of the peritoneal cavity was attempted. Following the operation all previously existing signs of peritonitis promptly disappeared.

Gangrenous Appendicitis; Intestinal Obstruction due to Adhesions; Appendicectomy; Secondary Celiotomy; Death.—Henry T., 46 years old, admitted November 10, 1902. Two days before admission patient had been seized with general abdominal pain, associated with vomiting and a chill. The abdomen was distended and very rigid. No mass was to be felt. Temperature 101°, pulse 76. The abdomen was opened through a rectus incision. A small quantity of cloudy fluid escaped from the peritoneal cavity. The intestines were congested and greatly distended. The appendix was removed and a drain was-

inserted to its stump. An additional drain was inserted into the peritoneal cavity. The abdomen was closed with through-and-through sutures. The appendix was two and a half inches long, its mucosa thickened and its serous coat congested. On the following day there were signs of consolidation at the bases of both lungs. Infection of the stitches took place and they had to be removed. By November 26 the signs in the lungs had almost entirely disappeared and the general condition had markedly improved. The temperature had been normal for three days. On November 27 the man was suddenly seized with severe cramp-like pain in the abdomen. He vomited a number of times. On November 28 the vomiting, as well as the pain, continued. The face was pinched and anxious. Temperature 101°, pulse 112. The abdomen was opened through a median incision below the umbilicus. A considerable quantity of bloody fluid escaped. Two loops of distended small intestine were punctured. There were extensive adhesions between the coils of gut and several distinct kinks were noticed. These were relieved. Two pieces of Cargile membrane were used to separate large raw areas. Irrigation with peroxide of hydrogen and salt solution. A cigarette drain was introduced into the pelvis and the wound partly closed. The wound of the former operation had been covered with a Murphy dam. The patient died on the following day. Wound examination showed the omentum under the median incision partly thrombosed. The intestines were uniformly distended. The Cargile membrane had not adhered, but had prevented the formation of adhesion.

Gangrenous Appendicitis; Abscess of Mesenteriolum; Appendicectomy; Death.— Robert J., 22 years old, admitted December 14, 1901. Six days before admission the man had been seized with general abdominal pain, which later became marked in the lower part of the abdomen. There had been repeated vomiting. The bowels had been moved with enemata. Temperature 103°, pulse 110. The abdomen was somewhat rigid and a tender mass was felt in the right iliac fossa. The abdomen was opened through a rectus incision. The omentum was found adherent to the appendix below the cecum. The appendix was removed and an abscess found near the base of its mesentery. A cigarette drain was introduced and the wound closed. On December 25 the liver was found to be markedly increased in size. On the following day it was aspirated in the eighth interspace and a few drops of pus obtained. On December 28 the abdomen was opened through a three-inch incision in the right hypochondrium. The liver was found to extend two inches below the free border of the ribs. Both lobes were aspirated in several directions, but no pus was found. On January 1 the liver was again aspirated through the wound, with negative result. This was repeated on January 4. On January 6 there were signs of pneumonia at the base of the right lung. Death took place suddenly a few hours later. At the autopsy multiple abscesses of the liver and multiple mesenteric abscesses were found.

Acute Gangrenous Appendicitis; Appendicectomy; No Drainage; Recovery.—Betsy W., 12 years old, admitted May 7, 1902. There had been no history of a previous attack. On the day before admission the child had been suddenly seized with severe pain in the right iliac fossa, but had not vomited. On the following day she had vomited. The bowels were constipated. There was rigidity over the lower half of the right rectus muscle, and a point of exquisite tenderness in the right iliac fossa. Temperature 104°, pulse 120, respiration 32. The abdomen was opened through a two-and-a-half-inch rectus incision. There was edema of the abdominal wall. After careful palpation of the abdomen, the incision had been made so that its centre was directly over the supposed location of the appendix. The point of greatest tenderness on light palpation was considered the most important guide in this matter. On opening the peritoneum the appendix was found directly in the wound, anterior to the cecum, and adherent to the abdominal wall. The entire appendix was thickened, and the mucosa at its tip completely gangrenous and on the point of perforating. The stump was cauterized with pure carbolic acid and the entire wound was closed. No drainage of any kind was employed. Owing to the serious condition of the child the operation was performed with great rapidity; the entire time, including the suturing of the wound, was only twelve minutes. Four days after operation the child developed a bright-red erythematous eruption, for which it was isolated seven days. With the exception of a slight superficial infection, the wound healed by primary union, and the child left the hospital well twenty-one days after operation.

Perforative Appendicitis; Diffuse Purulent Streptococcus Peritonitis; Appendicectomy; Cure.—Zillie D., 15 years old, admitted February 15, 1902. Six days before admission the child had complained of chilly sensations, loss of appetite, and constipation. On the day before admission she had vomited for the first time. Thereafter she had vomited repeatedly. Abdominal pain had been present for two days before admission and had increased in severity. The abdomen was generally tympanitic, but not markedly distended. Tenderness was more marked on the right side. Temperature 102°, pulse 104. The abdomen was opened by a rectus incision and a large quantity of yellow, odorless pus flowed out. There were no adhesions whatever. The appendix was removed from the inner side of the cecum. It was thickened and perforated at its tip. A cigarette drain was introduced into the pelvis and the wound closed. Culture of the pus showed streptococcus. On February 22 a secondary operation was done for the evacuation of a large intra-abdominal abscess. On March 3 a fluctuating mass was felt by rectum. On the following day the abscess was opened by a rectal incision. On March 17 an abscess was opened in the left iliac fossa. Thereafter convalescence was uninterrupted and the patient was able to leave the hospital on April 4, cured.

Perforative Appendicitis; Gangrene of Caput Coli; General Peritonitis; Death.—Davis S., 34 years old, admitted January 3, 1902. Three days before admission patient began to have pain in the abdomen, which became more severe and localized in the right side. He had vomited several times, but the bowels had moved. The abdomen was very rigid and tender, particularly in the right iliac fossa. Temperature 102°, pulse 120. On opening the abdomen through a rectus incision, there was an escape of seropurulent fluid. The intestines were deeply injected. The lower border of the cecum was gangrenous over an area of about three inches in diameter. The gangrenous appendix was removed. Packings were inserted and the wound left open. Death took place twenty-four hours later.

Acute Gangrenous Appendicitis; General Peritonitis; Appendicectomy; Death.—Alexander L., 14 years old, admitted November 11, 1902. Three days before admission the boy had been seized with pain in the lower part of the abdomen. There was continuous vomiting for twenty-four hours. The bowels had been moved with cathartics. The abdomen was slightly distended, very rigid, and there was general tenderness. Temperature 101°, pulse 92. The abdomen was opened through a rectus incision. There was free pus in the general cavity. The appendix was found on the outer side of the cecum and was removed. Considerable foul-smelling pus was sponged out of the pelvis. A cigarette drain was inserted into the pelvis and another one to the stump of the appendix. The appendix was completely gangrenous and its lumen was filled with foul-smelling pus. Following the operation there were signs of general peritonitis, and the boy died forty hours after operation. No growth was obtained from the culture.

Acute Perforative Appendicitis; General Purulent Peritonitis; Appendicectomy; Death.—Max B., 8 years old, admitted February 27, 1902. Four days before admission the child had been seized with severe abdominal pain, most marked on the right side, accompanied by vomiting and a severe chill. The pain and the vomiting persisted. The bowels had been moved by enemata. The abdomen was generally distended and tympanitic. There was dulness in both flanks. Temperature 101°, pulse 140. The abdomen was opened through a rectus incision. There was free pus in the general cavity. The intestines were congested and covered with fibrin. The appendix was removed from the inner side of the cecum. It was perforated at its centre and gangrenous throughout. Drains were introduced and the abdomen strapped. Death took place in twenty-four hours. No autopsy.

Acute Gangrenous Appendicitis; Diffuse Seropurulent Peritonitis; Appendicectomy; No Drainage; Recovery.—Annie K., 11 years old, admitted April 28, 1902. Patient had had an attack of appendicitis nine months before her admission to the hospital. At that time she

had been in bed for a week and had vomited several times. Ten days before her admission the child had been seized with severe pain in the right iliac region. This was accompanied by vomiting and a distinct chill. There had been vomiting on the following day, but the bowels had moved daily. On examination the child was found in poor condition. The tongue was moist and coated. There was a systolic murmur at the base of the heart. The entire abdomen was rigid, especially the lower half. Tenderness was marked over the lower half of the abdomen, especially on the right side. The abdomen was opened at once through the rectus incision. The parietal peritoneum was edematous. There was some injection of the coils of small intestine, and a moderate amount of turbid fluid in the general peritoneal cavity. The appendix was found pointing downward into the pelvis. It was partly gangrenous and was removed in the usual manner. The entire wound was closed with layer sutures, and no drain of any kind was used. The wound healed by primary union, and the child was able to walk out of the hospital, perfectly well, eighteen days after operation.

Acute Gangrenous Appendicitis; Appendicectomy; No Drainage; Recovery.—Abraham S., 13 years old, admitted August 15, 1902. There had been no previous attack. Two days before admission the boy had been seized with general abdominal pain accompanied by vomiting. The pain soon became localized to the right iliac fossa. The bowels had moved daily. The whole right side of the abdomen, especially the lower half, was rigid, and there was marked tenderness in the right iliac region. Temperature 101°, pulse 120. The abdomen was opened through a one-and-a-half-inch rectus incision. The appendix was found anterior to the cecum, adherent, thickened, and distended. Its mucosa was gangrenous. The appendix was removed without rupturing it, and the entire wound closed without drainage. The time of operation was twenty minutes. The wound healed by primary union. The patient got out of bed on the twelfth day and left the hospital fifteen days after operation.

Perityphlitic Abscess; Celiotomy; Death.—Simon H., 4 years old, admitted June 27, 1902. Ten days before admission the child had begun to vomit and the vomiting continued. The bowels could not be made to move. The abdomen gradually became distended. On admission the abdomen was markedly distended and tympanitic. No mass could be felt. By rectum a mass could be felt high up in the pelvis. On June 27 the abdomen was opened by a median incision. A loop of distended small intestines was punctured with the needle. An abscess in the region of the cecum was then opened. Drainage of abscess cavity and partial closure of wound. Shortly after the operation there developed signs of general peritonitis, which caused the patient's death in twenty-four hours.

Appendicitis; Pyosalpinx; Intraligamentous Cyst; Appendicectomy; Enucleation of Cyst; Salpingo oophorectomy; Cure.—Malvine R., 45 years old, admitted December 2, 1901. Patient had had one child twenty years before admission. There had been frequent attacks of pelvic pain, and during the few months prior to admission there had been several attacks of pain in the right iliac fossa. Four days before admission the patient had been seized with severe pain in the lower part of the abdomen; she had vomited several times. The bowels had not moved since the beginning of the attack. There was rigidity over the lower half of the right rectus, and a very tender spot just above Poupart's ligament on the right side, where, on deep pressure, a mass could be indistinctly felt. By vagina a boggy mass could be felt to the right of the uterus. Temperature 102.8°, pulse 135. Diagnosis: Pyosalpinx and appendicitis. The abdomen was opened through the rectus incision. Adherent omentum presented. A cyst in the broad ligament, the size of a lemon, was found and enucleated. The right tube was filled with pus and was likewise removed. The appendix was found behind the cecum, embedded in a mass of adhesions; it was also removed. A cigarette drain was led down to the stump of the tube and the wound sutured. Recovery was uneventful, and the patient was transferred to her home nine days after operation.

INTESTINAL OPERATIONS. TOTAL, 27; 19 DEATHS.

	Totals.	Deaths.
Appendicostomy, colostomy, and ileosigmoidostomy for ulcerative colitis	1	1
Colostomy for ulcerative colitis	1	1
" " cancer of rectum	2	1
" " imperforate anus	1	1
Celiotomy for volvulus	2	2
" " tumor of cecum	1	1
" " " " colon	1	1
" and resection of tumor of colon	1	1
" " " " " sigmoid flexure	1	1
" for intussusception	5	4
" " papillomatous proctitis	1	..
" " typhoid perforation	4	3
" " tumor of small intestine	1	..
" and resection for acute intestinal obstruction	1	1
" for acute intestinal obstruction	1	1
" " fecal fistula	2	..
Colocolostomy for carcinoma of colon and stomach	1	..

Appendicostomy (Weir) was performed in one case of ulcerative colitis. The operation failed to afford *rest* to the bowel, so colostomy had to be done. While the apparently large mortality in the intestinal operations is to be deplored, it was unavoidable from the very nature of the cases, as will be seen by the following reports.

Four cases of perforation in typhoid were operated upon, with only one recovery. While it seems incontrovertible that this compli-

cation is a distinctly surgical one, the results must depend upon the shortness of the period between perforation and operation and also on the general condition of the patient.

Ulcerative Colitis; Colostomy; Death.—Solomon L., 49 years old, admitted July 7, 1902. There had been bleeding from the rectum for ten years, which for two years prior to admission had been profuse. During the five months prior to operation the bleeding had been almost continuous. There had been a loss in weight of forty pounds in a year. The stools were examined for tubercle bacilli and for amebæ, with negative results. Operation on July 12. A longitudinal incision was made in the left lumbar region. The colon was found much thickened. A right-sided colostomy was then done and the appendix removed. Sections through the appendix showed glandular hyperplasia. The bowels were irrigated daily with nitrate of silver solution. There were five to seven stools a day, with blood and mucus. The temperature rose daily to 101° or 102° F. On August 24 the patient became comatose and had a general convulsion lasting five minutes. Two hours later there was a similar convulsion. On September 6 the patient complained of severe pain in the right chest and had bloody sputum; this was taken to be due to an embolus in the lung. Thereafter there was profuse purulent expectoration, with signs of an abscess in the right lung. The patient lost steadily and died on October 4. At the autopsy the left upper lobe was found consolidated. In the right upper lobe there was an abscess 9 cm. in diameter. The entire colon was the seat of a severe colitis with polypoid formations, with abscesses and with undermined ulcers. There were thrombi in the portal and mesenteric veins.

Chronic Ulcerative Colitis; Appendicostomy; Colostomy; Ileosigmoidostomy; Left Colostomy; Death.—Mollie F., 26 years old, admitted January 28, 1902. Patient had been married two years, had had two children and no abortions. Two years before admission the patient had begun to have frequent stools containing blood and mucus. There had been some abdominal pain. A few dilated hemorrhoidal vessels were cauterized with the Paquelin. In spite of this the stools continued to contain blood. On February 22 an incision was made through the right rectus. The tip of the appendix was cut off and a catheter about 20 F. was passed into the bowel through the lumen of the organ and left in place; cecum sewn into wound and wound packed. The colon was flushed out daily with 1:5000 silver nitrate solution. The frequent bloody stools continued as before. On March 15 an exploratory celiotomy was done on the left side. Numerous small glands were found in the mesosigmoid. One of these was removed for examination. The right colostomy wound was then enlarged and the caput coli drawn into the wound. A glass rod was placed under the caput coli through its mesentery. Gauze packings

were inserted and the wound left open. On March 17 the temperature was 103.4° and the pulse 112. The left wound had become infected. The extruded portion of the colon was incised with the Paquelin and a piece removed for examination. The colon was washed out daily with warm water; a rectal tube was introduced for the washings and the water allowed to run through until it came away clear. In spite of the fact that all fecal dejections passed at the colostomy wound, blood and mucus continued to be passed per rectum and the general condition continued to get worse. The temperature was continually elevated. During April for a short time no blood was passed per rectum. But soon blood and mucus were again passed per rectum. On May 10 the colon was excluded by an ileosigmoidostomy. A median incision was made below the umbilicus. A loop of ileum about five inches from the cecum was isolated and severed. Both ends were clamped. The same was done with the sigmoid. The proximal end of the small intestine was then sutured to the distal end of the large intestine. On account of the difference in size of the two loops, a longitudinal slit was made in the small intestine. Interrupted sutures of heavy silk were used, the knot being on the inner side of the gut. The suture line was reinforced with Lembert sutures. The extruded portion of the colon at the site of the previous colostomy wound was cut away. The median abdominal incision was closed with sutures. From May 17 to May 29 there were daily irregular rises in temperature, at times above 104° F. There were frequent watery movements, which were somewhat controlled by opium. During this time there was no blood in the stools. May 27, general condition poor; frequent defecations continue; discharge from colon is getting less; methylene blue irrigations three times a day. On May 29 a left-sided colostomy was done. An incision was made in the line of the former wound on the left side. The transverse colon was brought into the wound and was surrounded with packings. A silk purse-string suture was inserted, the bowel incised, and a tube introduced and tied in place. Irrigation of the bowel was continued daily. At times considerable mucus was washed away. On June 7 there was dulness with bronchial voice and breathing over the entire lower lobe of the right lung. No tubercle bacilli were found in the sputum, but almost pure culture of the diplococcus. The temperature rose to 104.6° and the pulse to 136. The consolidation of the lung remained unchanged, the temperature remained high, and the pulse became more and more feeble, until death took place on June 20. No autopsy.

Carcinoma of Rectum and Peritoneum; Colostomy; Death.—Benjamin R., 30 years old, admitted May 22, 1902. For five months prior to admission patient had had attacks of pain in the left side of the abdomen, with blood and mucus in the stools. There had been alternating constipation and diarrhea, and a loss in weight of twenty pounds. A large, nodular mass was felt in the rectum. On May 23

a right rectus incision was made. There was free fluid present. Numerous tumors were found, some in the omentum and one large one on the left side from which a piece was removed for examination. The diagnosis was adenocarcinoma. As there were signs of peritonitis with distension an enterostomy was done, but the patient died on the next day. The autopsy showed primary adenocarcinoma of the rectum with metastases in the general peritoneal cavity.

Carcinoma of Colon and Stomach; Colocolostomy; Death.—Abraham W., 68 years old, admitted April 8, 1902. During the four months prior to admission patient had suffered from anorexia, constipation, and epigastric oppression. Four days before admission there was an attack of severe abdominal pain. Patient had lost twenty-five pounds in four months. The abdomen was distended, tympanitic, and increased peristalsis was visible over the lower portion. There was a large, tender mass in the left hypochondrium and epigastrium. Operation on April 11, 1902. The abdomen was opened in the median line. There was some bloody fluid in the peritoneal cavity. The tumor was found to involve the splenic flexure and the stomach. An anastomosis was made with a Murphy button between the transverse and the descending colon. The ascending colon had so short a mesocolon that it could not be used for an anastomosis. All attempts to move the bowels after operation were unsuccessful and death took place six days after operation. At autopsy a tumor of the size of a fist was found in the greater curvature of the stomach. The microscope showed it to be a carcinoma.

Carcinoma of Hepatic Flexure; Resection; Death.—Annie G., 31 years old, admitted November 16, 1902. Patient had had nausea, epigastric pain, and constipation during four months prior to admission. There was a nodular mass on the right side of the abdomen below the free border of the ribs. Maunsell resection of the tumor was done on November 30 through a median incision. Gauze drains were led down to the suture line. Many enlarged glands were felt near the tumor. Death took place suddenly forty-eight hours after operation, apparently from heart failure. There were no signs of peritonitis.

Carcinoma of Descending Colon; Myocarditis; Resection of Colon; Death.—Meyer L., 45 years old, admitted January 7, 1902. Two weeks before admission there had been an attack of abdominal pain, which later became localized to the left iliac fossa. There had been neither constipation nor vomiting. In the left iliac fossa there was a tender tumor of the size of an apple. The tumor was not movable and could not be felt by rectum. On January 7 the abdomen was opened by a left rectus incision. The tumor was found adherent to the pelvic wall. In separating adhesions a few drops of pus were found. The tumor was in the wall of the sigmoid. Adherent omentum was removed and the gut resected. Silk sutures knotted in the

interior of the gut were used for the anastomosis, reinforced by a running Lembert suture. The line of suture was drained with strips of gauze. Following the operation the abdomen became distended, the pulse rapid, 138, and the bowels could not be made to move. On January 9 it was decided to open the cecum. A four-inch incision was made in the right iliac fossa, the cecum drawn into the wound, and packings placed around it. A tube was inserted into the cecum and held in place with two purse-string sutures. The intestines were found injected and distended. The patient died a few hours later. No autopsy.

Inflammatory Tumor of Cecum; Celiotomy; Death.—Morris G., 55 years old, admitted October 24, 1902. Twelve days before admission the man had had an attack of pain in the right iliac region; there was nausea but no vomiting. In the right iliac fossa there was a freely movable tumor of the size of a lemon. On October 25 a rectus incision was made over the tumor. The tumor was found to be very hard and surrounded the cecum. The appendix could not be found. In trying to liberate the bowel it was torn and the opening closed with silk sutures. Several pieces were removed for examination, and the abdomen closed with drainage. The pathologist reported chronic inflammation. The patient became septic and died four days after operation. Wound autopsy showed a large, inflammatory exudate behind the cecum and on either side of it. There was a deep ulcer inside of the cecum.

Tumor of Descending Colon; Intestinal Obstruction; Exploratory Celiotomy; Death.—Sadie G., 32 years old, admitted June 27, 1902. There had been a sudden onset four days before admission with severe general abdominal pain and vomiting. The vomiting persisted, but the bowels moved after enemata. Temperature 102°, pulse 112. The abdomen was somewhat distended, but it was lax, except during a spasm of pain, when it became rigid. Median celiotomy on June 29. There was some free fluid. The intestines were injected and distended. A firm tumor of the descending colon was found. The patient collapsed and the wound had to be closed. Following the operation there was fecal vomiting, and death took place in a few hours. At autopsy a small constricting carcinoma was found in the upper part of the descending colon.

Intra-abdominal Abscess; Incision; Tumor of Small Intestine; Resection; Closure of Fecal Fistula; Cure.—William K., 29 years old, admitted March 1, 1902. Two weeks before admission the man had been seized with general abdominal pain, which, two days later, had become localized in the right iliac fossa. The bowels had moved with cathartics. A large, tender, ovoid mass was felt on the right side of the abdomen. An incision was made over the tumor and several ounces of pus evacuated. The cavity was to the inner side

of the colon and was well walled off. Two tubes were introduced for drainage. On March 11 a capsule of methylene blue was given and twelve hours later the secretion of the wound was colored blue. The discharge persisted, and the patient left the hospital on May 16 with a discharging sinus. He was told to return, which he did on June 7, 1902. On June 14 an incision was made encircling the sinus. On opening the abdomen a tumor of the small intestine was found. The sinus led through the tumor into the gut. The tumor was in the ileum about twelve inches from the cecum. Three inches of the ileum were resected, silk sutures being used through-and-through, reinforced by Lembert sutures. A drain was introduced down to the suture line and the wound closed. The sutures became infected and there was no union of the abdominal wound. Six days after operation there was a profuse discharge of fecal matter from the wound. Later on a second smaller fecal fistula developed. The fecal discharge continued until August 14, when it was decided to close the fistulæ. The wound was curetted, the fistulæ packed with gauze and roughly closed with sutures. Under Schleich's local anesthesia the fistulæ were dissected down to the peritoneal cavity. Adherent omentum was tied off and removed. The general cavity was well walled off with gauze. The two ends of the affected loop of gut were caught with intestinal clamps. The fistulæ were reopened, the edges freshened, and the openings closed with silk sutures. A drain was introduced to the suture line and the wound closed. The patient stood the operation well and experienced little pain. From August 21 to August 26 there was a fecal discharge from the wound. Thereafter the wound healed rapidly, and the man left the hospital with the wound healed on September 16. The tumor proved to be a spindle-celled sarcoma.

Acute Intussusception; Celiotomy; Reduction; Cure.—Dora L., 3 years old, admitted December 5. Five days before admission the child had been seized with severe abdominal pain, with vomiting and passage of blood and mucus per rectum. The abdominal distension became progressively worse. The apex of the intussusception could be felt per rectum. On December 5 the abdomen was opened by a median incision below the umbilicus. There was some free bloody fluid. The intussusception, eight inches long, was relieved by traction and expression. It was found to be entirely colic in type. The abdomen was filled with saline solution and the wound closed. Six days after operation the child developed a bronchopneumonia. This soon cleared up and the child was able to leave the hospital cured on December 30.

Acute Ileocecal Intussusception; Celiotomy; Reduction; Death.—Abraham B., 5 months old, admitted April 20, 1902. During the two days prior to admission the child had had blood and mucus in the stools. During this time no fecal matter had passed. Rectal

examination showed a tumor high up on the left side of the abdomen. Temperature 104°, pulse 146, respiration 40. On opening the abdomen through a median incision an ileocolic intussusception was found. It was readily reduced and the abdomen was closed. Death took place in twelve hours. No autopsy.

Gangrenous Intussusception; Resection; Death.—Paul A., 9 months old, admitted July 1, 1902. Four days before admission the child had passed blood and mucus per rectum. The abdomen had become distended and the bowels could not be made to move. The abdomen was distended and rigid. By rectum a soft mass could be felt protruding into the lumen of the bowel. A median abdominal incision was made. The intussusception was found to be ileocecal and could not be reduced. Resection was done by end-to-end silk sutures. The abdomen was closed. The resected loop of gut was gangrenous. The child went into collapse and died four hours later. No autopsy.

Acute Ileocecal Intussusception; Resection; Death.—Solomon L., 5 months old, admitted January 23, 1902. This case was almost identical with the preceding one. The anastomosis was made with a Murphy button and death took place nine hours after operation. At the autopsy a small amount of bloody fluid was found in the right side of the abdomen. There was no leakage at the site of the button.

Volvulus of Sigmoid and Descending Colon; Celiotomy; Reduction; Death.—Ida K., 40 years old, admitted May 11, 1902. Sudden onset, two days before admission, with pain in right iliac fossa and vomiting. Constipation was absolute from the onset, and vomiting was repeated. The abdomen was tympanitic and much distended. Median celiotomy showed a volvulus of the sigmoid and ascending colon. The distension was relieved by three punctures, the openings being closed by sutures. A rectal tube was then inserted and a large amount of fluid feces and gas came away. It was then easy to untwist the volvulus. All the obstructive symptoms were relieved by the operation, but the patient died twenty-four hours later. No autopsy.

Volvulus of Sigmoid Flexure; Celiotomy; Reduction; Death.—Rose J., 45 years old, admitted October 12, 1902. This case was almost identical with the preceding one and the patient died eighteen hours after operation. No autopsy.

Imperforate Anus; Colostomy; Death.—Infant D., two days old, admitted July 11, 1902. The child had vomited since birth and had passed neither gas nor feces. The abdomen was distended and tympanitic. On inserting the finger into the anus an absolute obstruction was met with. Median celiotomy and opening of a loop of distended large intestine. Meconium escaped and a tube was inserted into the bowel. Death took place thirty hours after operation. Autopsy

showed a septum, one-eighth of an inch thick, about a half-inch from the anus, by means of which the continuity of the bowel was interrupted. There was no peritonitis. In the heart an open foramen was found.

Acute Intestinal Obstruction; Resection and Anastomosis; Death.—Sarah D., 14 years old, admitted August 17, 1902. Three days before admission patient had been seized with cramps in the upper part of the abdomen, with repeated vomiting. The bowels had moved after an enema. The abdomen was much distended, with dulness in the flanks. Temperature 101.6°, pulse 150, respiration 24. Patient had not passed urine for twelve hours and only one ounce was found in the bladder. Operation was deferred on account of the bad general condition. The condition did not improve and operation was undertaken on August 19. A right rectus incision was made and considerable bloody fluid evacuated. Two knuckles of small intestine were found compressed by a band extending from the abdominal wall to the mesentery. On relieving the constriction one knuckle of gut was found severely injured, with a perforation at the site of constriction. Resection of the gut was done with the aid of the Murphy button, and a drain led down to the suture line. The patient collapsed at the end of the operation and died nine hours later. No autopsy.

Acute Intestinal Obstruction; Celiotomy; Death.—Mollie P., 24 years old, admitted September 14, 1902. The patient had been operated on in May, 1902, for an ovarian cyst, and had made an uneventful recovery. Four days before admission she had been suddenly seized with pain in the epigastrium, nausea, and vomiting. During these four days neither stool nor gas had been passed. Vomiting had continued. The abdomen was not distended and no mass was present. Subcutaneous saline injections were given to increase the amount of urine. On September 16 the abdomen was opened in the median line. The intestines were matted together and injected; the upper coils of small intestine were distended. About three feet of the ileum and the entire large intestine were collapsed. The collapsed coils of small intestine were adherent throughout their entire extent to one another. The adhesions were separated as much as possible. The poor condition of the patient prevented further procedure. An intravenous infusion was given on the operating table. On the following day vomiting persisted. A loop of intestine was drawn into the wound, opened, and a tube inserted. Death took place a few hours later. No autopsy.

Typhoid Perforation; Purulent Peritonitis; Suture of Perforation; Death.—Aaron Z., 23 years old, admitted August 13, 1902. On the fifth day after admission to the medical division for typhoid fever a perforation of the intestine was diagnosed and the case referred to the surgical side. Operation was performed about thirty hours after

the perforation had taken place. A median incision was made below the umbilicus. There was a purulent peritonitis. A perforation was found in the ileum, covered with fibrin. The opening in the gut was sutured. The abdomen was irrigated with peroxide of hydrogen and saline solution, and it was then closed. The patient lost ground steadily and died forty-eight hours after operation. At autopsy a small amount of bloody fluid was found in peritoneal cavity. Adherent coils of gut in the right iliac fossa were covered with fibrin. There was no leakage at the suture line.

Typhoid Perforation; Suture of Perforation; Recovery.—Rebecca H., 6 years old, admitted July 26, 1902. The child had been ill with typhoid fever for thirteen days. There had been some blood in the stools. On July 14 the abdomen became distended and rigid, and the patient was transferred to the surgical side for operation. Before operation temperature 104.4°, pulse 180, respiration 40. Operation was performed sixteen hours after symptoms of perforation. A median abdominal incision was made. There was turbid fluid in the peritoneal cavity. A perforation was found in the ileum near the ileocecal valve. The opening was closed with silk sutures and the abdomen closed with drainage. No saline irrigation was attempted. The wound healed by primary union. Several small abscesses appeared in various parts of the body. On September 2 the child was referred back to the medical side with an almost normal temperature. Further convalescence was uneventful.

Typhoid Perforation; Suture of Perforation; Death.—Benjamin M., 22 years old, admitted October 3, 1902. Patient had been in the hospital ten days with typhoid fever. On October 12 there were signs of intestinal perforation, and the man was referred to the surgical side. Patient had been sick twenty days before operation. Six hours before operation patient had a chill with temperature of 106° and pulse 122. A tympanitic note developed over the lower border of the liver and the abdomen became somewhat distended. On opening the abdomen in the right iliac fossa a moderate amount of free fluid escaped. A small perforation was found six inches from the cecum. The opening was closed with silk sutures and a cigarette drain led down to the suture line. On the following day there was repeated vomiting and the abdomen became much distended. Death took place twenty-four hours after operation. No autopsy.

Typhoid Perforation; Suture of Perforation; Death.—Benjamin L., 22 years old, admitted November 28, 1902. This case was very similar to the preceding one. The man had been sick about a week. He had been in bed only three days. Two days before operation the diagnosis of typhoid fever was made. Perforation probably took place twelve hours before operation. A two-and-a-half-inch incision was made along the edge of the right rectus. There was a large amount

of fecal fluid in the peritoneal cavity. The perforation was sutured over with silk, and the cavity irrigated with saline solution. Before operation temperature 103.2 +°, pulse 140. The method of procedure was the same as in the preceding case. Death took place forty-eight hours after operation. No autopsy.

MISCELLANEOUS ABDOMINAL OPERATIONS. TOTAL, 20; 4 DEATHS.

	Totals.	Deaths.
Incision and drainage of abscess of abdominal wall	3	..
" " " " intra-abdominal abscess	4	..
Celiotomy for omental tumor	1	..
" " intra-abdominal omental torsion	1	..
" " pyosalpinx, intraligamentous cyst, and chronic appendicitis	1	..
" " pyosalpinx and general peritonitis	1	1
" " tuberculous peritonitis	1	1
" " diffuse peritonitis	1	1
" " general "	2	1
" " fibrinous "	1	..
" " post-operative abdominal adhesions	2	..
" " " " sinus	1	..
" " sarcoma of mesenteric glands	1	..

Another case of intra-abdominal omental torsion appears in our list. As yet we have no means of recognizing the condition before section. It is usually mistaken for appendicitis.

Tuberculous Peritonitis; Exploratory Celiotomy; Death.—Leiser H., 7 years old, admitted March 21, 1902. Four weeks before admission the abdomen had begun to enlarge; two quarts of clear fluid had twice been withdrawn. There was nausea, vomiting, and swelling of the feet. The child was poorly nourished and there was general glandular enlargement. The abdomen was much distended, tympanitic, and there were evidences of fluid. Coils of gut were to be felt in various parts of the abdomen. Fourteen ounces of fluid were withdrawn. Temperature 103°, pulse 120, respiration 30. On April 5 the abdomen was opened by a median incision above the umbilicus; a distended loop of intestine was accidentally injured. The wound was promptly sewed up. The intestines were found intimately matted together by soft granular adhesions. Section of this granular tissue was removed for examination. The abdomen was closed with drainage. On April 15 there was a slight fecal discharge in the wound. An attempt was made to close the opening in the gut, but it failed. Thereafter there was a profuse fecal discharge from the wound until May 3, when the child died.

Diffuse Purulent Peritonitis; Celiotomy; Death.—Jacob M., 35 years old, admitted December 25, 1901. During the four years prior to admission patient had had frequent attacks of abdominal pain

associated with vomiting. Thirty-six hours before admission he had been seized with severe pain in the epigastrium, later becoming localized in the right iliac fossa. There had been no vomiting. The abdomen was distended and tympanitic. The liver dulness was obliterated and there was dulness in both flanks. There was general abdominal tenderness, but no mass was to be felt. The abdomen was opened through a three-inch rectus incision. On opening the peritoneum a large quantity of gas and purulent fluid escaped. The patient's condition was so bad that further procedure was impossible. A glass tube was inserted into the pelvis and the abdomen strapped. Death took place in five hours. Autopsy showed a general purulent peritonitis without discoverable cause.

General Peritonitis; Celiotomy; Death.—Max S., 3 months old, admitted June 9, 1902. Three days before admission the abdomen began to increase in size and the bowels could not be made to move. The abdomen was much distended, tympanitic, and dull in both flanks. Temperature 104°, pulse 148. A median incision was made. The appendix was found normal. There was a general purulent peritonitis. Hot saline solution was poured into the abdomen and the wound rapidly closed. The child died six hours later. No autopsy was permitted.

General Peritonitis; Pyosalpinx; Celiotomy; Appendicectomy; Death.—Annie G., 23 years old, admitted August 7, 1902. Four days before admission patient had been seized with general abdominal pain. Pain increased in severity and became more severe in the left iliac region. She had vomited several times. The abdomen was distended and tympanitic. No mass was to be felt. Operation July 27, 1902. Median incision five inches long. There was turbid fluid in the general cavity. There were numerous adhesions around the cæcum. A right rectus incision was then made and an adherent appendix removed. Both wounds were closed. Following the operation there were signs of peritonitis, temperature rose to 106°, and death took place about forty-eight hours after operation. Autopsy showed a general peritonitis and a pyosalpinx on the right side.

Intra-abdominal Omental Torsion; Excision of Omentum; Cure.—Benjamin S., 21 years old, admitted November 25, 1901. Three days before admission patient had been seized with cramp-like pains in the left side of the abdomen, which later became localized in the right hypochondrium. There had been no vomiting and no chill. The bowels moved daily. The right rectus was very rigid and tender. Operation on November 26. Right rectus incision was made and a mass of deeply congested omentum was found adherent to the abdominal wall. The pedicle was found to be just below the transverse colon and consisted of twisted omentum. The entire omentum had been twisted twice to the left and then three times to the right.

The pedicle was ligated and the entire omentum cut away. The abdomen was closed. Convalescence was uninterrupted and the patient left the hospital on December 18.

HERNIOTOMIES—62; 1 DEATH.

	Totals.	Primary union.	Suppuration.	Open treatment.	Drained.	Died.
Inguinal, reducible, Bassini's operation	37	31	5	1	2	..
" congenital, " "	5	5	..	..	1	..
" " " " plastic operation for undescended testis	3	3	..	..	..	..
" strangulated, Bassini's operation	2	2	..	..	1	..
" interstitial, " "	1	1	..	..	1	..
Femoral, Bassini's operation	8	7	1	..	..	..
" strangulated, kelotomy[1]	2	..	..	..	1	1
Umbilical, "	2	2	..	..	1	..
Ventral	1	1	..	..	..	..
" incarcerated, Gersuny's operation	1	1	..	..	..	..

Sixty-two operations for hernia were done during the past year, with one death. The patient who died was a woman who had a strangulated femoral hernia with gangrene of the intestine.

Suppuration occurred in six cases. In all the suppuration was slight in character; three times it was due to the infection of a hematoma which had formed under the skin and had been opened.

In four of the cases in the foregoing table, noted under the heading "Drained," a small rubber tissue drain was inserted under the skin at the time of the operation, on account of the presence of much fat in the subcutaneous tissue.

In three patients with congenital inguinal hernia and undescended testicle, the testis was brought down into the scrotum by a plastic operation upon the epididymis (see remarks under the heading "Operations on the Testis").

After an operation for hernia, a firm compression bandage should always be applied for the purpose of obliterating dead spaces and causing primary adhesion. For additional pressure we are accustomed to apply a roll of gauze over the suture line, *under* the dressing.

The patients upon whom Bassini's operation was done were kept

[1]See intestinal **operations.**

in bed two or three weeks, and were instructed to wear no truss or abdominal support, and, if possible, to refrain from hard work for one or two months.

Interstitial Inguinal Hernia; Cystic Tumor in Sac; Bassini's Operation (modified); Removal of Cystic Ovary; Cure.—Jennie T., 36 years of age, admitted June 25, 1902. Patient had had an irreducible hernia on the right side for eight years, which had slowly increased in size. The hernia was about the size of a child's head, and the sac consisted of two parts—an upper, which extended between the layers of the abdominal wall for a distance of four inches and contained reducible intestine; and a lower, which extended into the labium majus of the right side and contained an irreducible cystic tumor of the size of a large kidney. Vaginal examination was negative. At the operation on June 28 the cystic tumor was found to be an ovarian cyst, irreducible on account of the relatively small size of the inguinal ring. The superior part of the sac ran upward and outward underneath the external oblique aponeurosis for about four inches, and contained reducible intestine and omentum. The intestines were reduced, the ovarian cyst removed, the hernial sac freed from the surrounding adhesions, tied off at its neck, and cut off. The tissues in the inguinal region were so much relaxed that Poupart's ligament ran from the spine of the pubes downward and outward, and then upward on the thigh, leaving fully one inch of the femoral vessels exposed. The conjoined tendon, about two inches from its free border, was first sewn to the pectineal fascia, and a typical Bassini operation then done. Convalescence was uninterrupted, the wound healed by primary union, and the patient was discharged cured on July 16, eighteen days after operation.

Irreducible Inguinal Hernia containing the Bladder; Bassini's Operation (modified); Cure.—Joseph K., 35 years old, was admitted to the hospital on September 19, 1902, with a large, partly reducible inguinal hernia on the right side of five years' standing. The hernia could not be controlled by a truss, had steadily increased in size, and had caused the patient much discomfort. Urination was impossible when the hernia was down, and could be accomplished only after forcible pressure was made upon the tumor in an upward and inward direction. September 20: Operation; gas and ether anesthesia. After resection of some omentum the contents of the sac were reduced, but the bladder, which was adherent to the inner wall of the sac, could not be freed from its adhesions or returned into the abdominal cavity. During these manipulations a small opening was inadvertently made into the bladder and a little urine escaped. The opening was at once closed by a double layer of Lembert sutures and as much of the organ as possible returned into the abdominal cavity. The conjoined tendon was then united to Poupart's liga-

ment in the usual manner, the cut edges of the external oblique aponeurosis united over the spermatic cord and bladder, and the skin closed with drainage. Convalescence was slow but uninterrupted. The patient was discharged with a firm scar on October 15. There was no longer any difficulty in urination.

Strangulated Femoral Hernia; Gangrene of Small Intestine; Resection; Murphy Button Anastomosis; Death.—M. F., female, was admitted on October 3, 1902, with a history of abdominal cramps of seven days' standing, absolute constipation, and vomiting of four days' standing. Physical examination showed that there was a small hernia in the left femoral region, and that the abdomen was slightly distended and tender. Temperature 101.8°, respiration 28, pulse 140. Immediate operation was done; three and one-half inches of gangrenous small intestine resected; end-to-end anastomosis with Murphy button; wound left open and drained. The patient's condition was very poor during the entire operation; it did not improve afterward. Death occurred nine hours after operation. A wound examination showed that the implicated gut had been completely resected and that the anastomosis had been perfect.

OPERATIONS ON THE KIDNEY—13; 3 DEATHS.

	Totals.	Deaths.
Nephrolithotomy for nephrolithiasis	1	..
Nephrotomy for tubercular pyonephrosis	1	..
" " pyelonephritis	1	..
" " chronic nephritis	1	..
Nephrectomy for calculous pyelonephritis	1	..
" " pyonephrosis	2	1
" " hypernephroma	3	2
Incision of perinephritic abscess	3	..

In almost all of the operations upon the kidney, preliminary cystoscopy and, if possible, catheterization of the ureters was done. Important information was several times obtained by cystoscopy alone. Whenever calculous disease of the kidney was suspected radiographic plates were made and some valuable knowledge thus obtained.

Although nephrectomy is often necessary in calculous renal disease, nephrolithotomy is the ideal operation. The case abstracted below may serve as an example. The patient's history is interesting on account of the occurrence of a wound complication that is occasionally met with after the internal use of urotropin.

It is our common practice to give urotropin as a urinary antiseptic to every patient who is to be operated upon for renal or vesical disease, or in whom catheterization is necessary. In several of the cases—especially in the patients who had wounds of some part

of the genitourinary tract which were continually soiled by the escaping urine—we have observed a peculiar wound necrosis due, apparently, to the urotropin. This necrosis was very superficial; the granulations looked as if they had been superficially cauterized by some agent. Evidence that the superficial necrosis was due to the formalin that was set free by the splitting up of the urotropin, and was present in the escaping urine in which the wound surface was bathed, was afforded by the fact that upon stoppage of the urotropin, within a few days the wounds again took on a healthy appearance. We have also observed that in some patients who are taking this drug the wounds seem to heal slowly. Thus small granulating wound surfaces which have persisted for some time in spite of all treatment would heal with great rapidity when the urotropin was stopped. We believe that cases of this kind have recently been reported in medical literature.

In all operations for calculous disease of the kidneys, we never omit to pass a ureteral sound or catheter down the ureter in order to assure ourselves of the patency of the canal. In the performance of nephrotomy, the kidney is brought out upon the loin and the pedicle compressed by the fingers of an assistant before the incision into the renal substance is made. By this means hemorrhage is almost entirely avoided.

During the past year nephrectomy was done six times, with three deaths. One of the deaths occurred in a patient with a tumor of the kidney, who died two months after the operation from abdominal metastases; another in a patient who had a pyonephrosis as a complication of staphylococcemia; the third patient died from exhaustion twelve hours after the operation.

Renal Calculi; Nephrotomy and Nephrolithotomy; Cure.—Bertha E., 32 years of age, was admitted as a private patient May 15, 1902, with a history of renal disease of twelve years' duration. Twelve years before, the patient had a typical attack of renal colic with the passage of a stone from the right kidney. Five years later she passed a calculus from the other kidney. After the passage of another stone from the left side, two years afterward, the patient felt perfectly well until one year ago. Pains in the left lumbar region then recurred and remained fairly constant up to the present time. She had frequent attacks of colic and noticed that her urine became cloudy. One month before admission to the hospital she began to have chills and fever, with rapid loss of flesh and strength; the urine at the same time became more cloudy and sometimes contained

small quantities of blood. May 20: Operation. Preliminary cystoscopy showed that the right ureteral opening was normal and clear urine was seen to escape from it; the left ureteral opening could not be found. Under anesthesia the left kidney was not palpable. The left kidney was exposed through an oblique incision below the free border of the ribs; the organ was not enlarged, but its pelvis was felt to be full of stones. The kidney was brought out upon the loin, the pedicle compressed by the fingers of an assistant; an incision made into the pelvis through the convex border; ten large faceted calculi removed; the ureter catheterized and found patent; the pelvis washed out with normal salt solution. As the kidney itself did not seem to be diseased, the incision in it was closed with chromic gut sutures, the organ returned into its bed, and the soft parts closed with free drainage. After the operation the urine became much more clear, and the case ran an uneventful course until May 31. On that day, four days after the internal use of urotropin had been begun, the patient complained of severe pain in her wound. Examination showed that the entire granulating wound surface was covered by a superficial slough. The urotropin was at once stopped. Two days later the wound was again clean and the granulations healthy; the urine was almost perfectly clear; the patient was free from all pain. The dressings had been slightly wet with urine during the entire time since the operation, but the urinary discharge ceased on June 4. Thereafter convalescence was uninterrupted; the patient gained flesh and strength rapidly; the wound was entirely closed by July 3; the urine was still slightly cloudy. July 3, discharged cured. (*Note*—August 10: The patient has gained twenty-five pounds in weight.)

Hypernephroma of Kidney; Nephrectomy; Cure.—Jennie K., 28 years old, admitted November 20, 1901, discharged cured January 8, 1902. This patient gave a history of attacks of hematuria during the three months preceding her admission to the hospital, with occasional pains in the right lumbar region, but without loss of flesh or strength, or other symptoms. The pain in the right lumbar region had become more severe and the hematuria more marked for the last twelve hours. Physical examination showed that the right kidney was palpable and slightly tender, and that the urine contained considerable blood. After rest in bed, the blood almost entirely disappeared from the urine and the pain became much less. X-ray examination of the right kidney gave no evidence of the presence of calculi. November 30: Cystoscopy. Marked congestion and numerous ecchymoses around the right ureteral opening. The patient was anesthetized and the right kidney exposed by the usual incision. The lower pole was found to be occupied by a tumor of about the size of a walnut. Nephrectomy was done and several clamps left on the vessels on account of otherwise uncontrollable bleeding. On the evening after the operation the clamps had to be reapplied on account

of a sudden active secondary hemorrhage. Thereafter convalescence was absolutely uneventful; the clamps were removed one week later; the patient was discharged with a healed wound and a clear urine on January 8.

Hypernephroma of Kidney; Nephrectomy; Abdominal Metastases; Death.—Max G., 37 years old, admitted December 11, 1901. For four months the patient had lost flesh and strength; for ten days he had passed bloody urine. The patient was fairly well nourished. The right flank was occupied by a hard, nodular tumor which extended down to the level of the umbilicus and to the median line of the body. The urine contained a large quantity of blood and hyalogranular casts. Temperature 101.4°, pulse 100, respiration 26. For two days the temperatures ranged between 100° and 103°, and the urine was free from blood at times. December 14: Operation; gas and ether anesthesia. Tumor exposed by an incision five inches long and parallel with the last rib, joined by a vertical incision at its posterior end. The peritoneum was so firmly adherent to the tumor that it was freed only with much difficulty. The tumor was delivered without much hemorrhage and the pedicle tied off with a rubber ligature and divided. The wound was closed with drainage. December 17: Patient in good condition; wound dressed; looks well. December 21: Respiration 56; patient is suffering from dyspnea; numerous dry râles at both bases. December 25: Diminished voice and breathing at right base. December 31: Rubber ligature removed; wound looks well; temperature 102° to 103°, pulse rate 100-110; respiratory signs unchanged; small amount of fluid in abdomen. January 2: Small, hard, tender mass in right hypochondrium; slight edema of lower extremities. January 4: Coley's fluid injections begun, four minims into the abdominal wall every day and increased one minim daily. January 10: Mass in right hypochondrium larger; small tumor to be felt in left splenic region. Temperatures irregular, between 100° and 103°; pulse 110 to 120. Long sinus persists at the site of the operation. January 12: Patient rapidly losing flesh and strength; abdomen full of fluid and the tumors in the right and left hypochondriac regions growing larger.

From this time on the patient grew more and more cachectic. A few days before death he developed a right hemiplegia, probably of embolic origin. He died from exhaustion on February 14. Permission for a postmortem examination was not obtained.

Perithelioma of Kidney; Suprapubic Cystotomy; Nephrectomy; Death.—Meyer M., 60 years of age, was admitted on April 19, 1902. One month before admission the patient had two attacks of pain in the right side of the abdomen, with hematuria. After a week of improvement the hematuria returned and persisted up to the time of admission. The patient's condition was fair. Physical examination of the renal regions was entirely negative, but the urine was deeply blood-stained. April 22: Cystoscopy. Markedly trabeculated

bladder; prostate considerably enlarged. Suprapubic cystotomy was done, but no cause for the hematuria could be found in the bladder. The openings of the ureters were so small that catheterization was impossible. Suprapubic drainage. For the following two weeks the patient ran irregular temperatures up to 102°. No tubercle bacilli were found in the urine. May 17: Nephrectomy. Left kidney exposed, but found normal; right kidney exposed; the organ was somewhat enlarged; there was a soft yellow tumor at its upper pole. An attempt was made to excise the tumor, but it was so friable that its radical extirpation was impossible. The entire kidney was therefore removed. The patient was suffering considerably from shock at the end of the operation, and he did not recover, but died about twelve hours later. No autopsy. Pathological examination of the tumor showed it to be a hypernephroma of the usual peritheliomatous type.

Staphylococcemia; Pyonephrosis; Nephrectomy; Death.—Morris F., 56 years old, was transferred to the surgical service on August 19, 1902. The patient had been in the medical division for sixteen days with all the symptoms of septicemia of unknown origin. Bacteriological examination of the blood and the urine showed the presence of staphylococcus aureus in pure culture. On August 19 the patient had complained of pain in the hepatic and right lumbar regions; physical examination had demonstrated the presence of tenderness in the right hypochondriac and lumbar regions; at the same time the general condition had become much worse. Aspiration of the right lumbar region gave pus. The right kidney was exposed by the usual incision; it was found to contain several large abscesses. Nephrectomy was done and the patient sent to bed in very poor condition. Death occurred eight hours later. No autopsy.

OPERATIONS ON THE BLADDER, PROSTATE, AND URETHRA—32; 2 DEATHS.

Bladder—19; 2 Deaths.

	Totals.	Deaths.
Suprapubic cystotomy for chronic cystitis	1	..
" " " vesical calculus	2	..
" " " retention of urine	1	..
" " " carcinoma of prostate	1	1
" " " hypertrophy of prostate and cystitis	1	1
" " exploratory	1	..
" " preliminary to suprapubic prostatectomy	6	..
" " in the course of other operations	2	..
Perineal section for epispadias	1	..
Plastic for suprapubic sphincter	1	..
Cauterization of suprapubic fistula	1	..
Suture of suprapubic fistula	1	..

Prostate—8; No Deaths.

Incision and drainage of prostatic abscess	2	..
Suprapubic prostatectomy	6	..

Urethra—5; No Deaths.	Totals.	Deaths.
External urethrotomy for stricture	2	..
Plastic operation for hypospadias	1	..
" " " epispadias	1	..
Dilatation of urethra for extraction of foreign body from bladder	1	..

During the past year prostatectomy by the suprapubic method was done six times, without a death, and in every case with excellent functional results. The ages of the patients were 53, 64, 64, 71, 75, 80 years; the different lengths of time they remained in the hospital, 29, 53, 35, 65, 34, and 44 days, respectively. The patient who remained in the hospital 65 days did so on account of an epididymitis which resolved with extreme slowness. The patients began to pass their urine through the natural channel in from one to two and one-half weeks; the earliest was on the seventh day and the latest on the seventeenth day. When discharged from the hospital all were able to urinate through the urethra without pain or difficulty. They were sometimes allowed to sit up in bed as early as the third or fourth day after the operation.

It is believed that the hemorrhage which occurs after the suprapubic operation can always be controlled by gauze packings inserted through the suprapubic wound. The shock from the operation is a remarkably small one; it is often astonishing how well the patients, who are always far advanced in age and the subjects of many senile changes, bear the removal of the prostate. The rapidity with which the suprapubic wounds close is also worthy of mention. In the majority of cases the bladder regains its contractile power within a few weeks after the prostate has been removed.

The clinical histories of a few typical cases are given in what follows. The patient in whom Bottini's operation had been done without success some months before is of especial interest.

Hypertrophy of Prostate; Suprapubic Prostatectomy; Cure.—Samuel G., 53 years old, admitted February 2, 1902; discharged cured March 18, 1902. Typical symptoms of enlargement of the prostate existed. First attack of retention occurred two weeks before admission, since which time the continued use of the catheter was necessary. The urine contained a heavy sediment of pus, but no casts. Rectal examination showed both lobes of the prostate enlarged; there were three ounces of residual urine; the left testicle was swollen and tender. February 8: Operation; gas and ether anesthesia; suprapubic cystotomy. Two large lateral lobes, each of the size of a hen's egg, removed; on account of rather active hemorrhage the bladder

packed with adrenalin gauze. February 9: Packings removed; bladder irrigations commenced. February 18: Tube removed; bladder opening almost closed. February 23: Urine partly passed through the urethra; bladder irrigations continued; urine much clearer. February 27: Suprapubic wound closed; residual urine one-half ounce. Bladder holds about four ounces and patient has to pass his urine about every two hours. March 14: Bladder now holds six ounces; no residual urine; urine clear. March 18: Discharged cured.

Hypertrophy of Prostate; Suprapubic Cystotomy; Cure.—Henry K., 71 years of age, admitted as a private patient June 18, 1902; discharged cured July 22, 1902. This patient gave the usual history and symptoms of hypertrophy of the prostate gland, with purulent cystitis due to infection with the catheter. June 20: Chloroform anesthesia; suprapubic prostatectomy. Two lateral and the median lobes removed with but little difficulty; hemorrhage moderate; bladder drained with tube and packed with gauze. July 1: Highest temperature since operation, 100.6°; highest pulse rate, 104; tube removed; urine much more clear; out of bed. July 7: Urine passed through the urethra; suprapubic wound very small; irrigations with solutions of silver nitrate. July 15: Suprapubic wound almost healed; no residual urine; bladder will hold five and one-half to seven ounces of fluid; patient urinates without difficulty every two to three hours. July 22: Suprapubic wound closed; urine still contains some pus; discharged cured.

Hypertrophy of Prostate; Suprapubic Prostatectomy; Cure.—Dr. N. M., 64 years of age, admitted as a private patient July 14, 1902; discharged cured August 18, 1902. This patient, a physician, had suffered from the symptoms of enlarged prostate with attacks of cystitis for about seven years. Bottini's operation had been performed upon him by another surgeon one year ago, but with only transitory improvement. The patient had to urinate five to six times daily, and had from twelve to sixteen ounces of residual urine. There was almost constant "overflow" at night, so that patient's bed was never dry. July 15: Operation; gas and ether anesthesia; suprapubic cystotomy. The two enlarged lateral lobes of the prostate, each the size of a pigeon's egg, were first removed; then the median lobe, which had been accurately divided by the Bottini incisor at the former operation, so that the two halves were found lying packed together in such a manner as to cause absolute retention. Lastly several small fibrous nodules surrounding the opening of the urethra were shelled out. Hemorrhage moderate; bladder packed with gauze. July 22: Highest pulse rate since operation, 96; highest temperature, 100.6°; tube removed; bladder irrigations. July 29: A little urine passed through urethra. July 30: Out of bed. August 4: Greater part of urine passed through urethra; suprapubic wound almost closed. August 12: All urine passed through the urethra; suprapubic

wound closed; no residual urine; urine passed every two to five hours. August 18: Discharged cured.

Hypertrophy of Prostate; Hematuria; Diabetes; Suprapubic Cystotomy and Drainage; Diabetic Coma; Death.—Rubin L., 70 years old, was admitted November 21, 1901, with a history of frequent bloody urinations for six to eight weeks. Physical examination showed that the patient was in poor condition; by rectal examination the prostate was much enlarged; residual urine, fifteen ounces; the urine contained blood and pus cells. November 24: Suprapubic cystotomy and drainage, but no operation upon the prostate. November 25: Stupor; Cheyne-Stokes respiration; .2 per cent. of sugar in urine; no acetone or diacetic acid. November 29: Coma; temperature 109°; death. Postmortem examination not permitted.

Carcinoma of Prostate; Suprapubic Cystotomy and Drainage; Death.—J. S. L., 49 years of age, was admitted as a private patient May 14, 1902. For six months the patient had suffered from pain in the prevesical region, with loss of flesh and strength. For one month he had passed bloody urine. The prostate gland was much enlarged and tender; enlarged glands were felt in the concavity of the sacrum; the urine contained casts and blood; there was advanced myocarditis and great edema of the lower extremities from pressure upon the veins by the carcinoma. May 15: Operation; suprapubic cystotomy. Prostate found much enlarged; urethra filled by large tumor masses; large tumor on left lateral wall of bladder; specimen removed for pathological examination; drainage of bladder. The pathologist reported that the section of tumor removed was an epithelial carcinoma. The patient, who was in poor condition when he was operated upon, lost flesh and strength rapidly; he died on May 20. No autopsy.

OPERATIONS ON THE PENIS—1.

	Totals.	Deaths.
Circumcision for phimosis	1	..

OPERATIONS ON THE TESTIS—14; 1 DEATH.

Varicocele, extirpation	4	..
" ligation	1	..
Hydrocele; extirpation of tunica vaginalis	1	..
" Volkmann's operation	1	..
" of cord, Bassini's operation	1	..
Abscess of testis; incision and drainage	1	..
Hematoma of testis from torsion of cord; castration	1	..
Sarcoma of testis; castration	1	1
Undescended testis; plastic operation on epididymis	3	..

In a large number of cases the results of the operation of orchidopexy are very unsatisfactory. In many cases it is possible to draw down

and fix the testis in the scrotal sac at the time of the operation, but the testis is almost certain to slip up again soon afterward. During the past year we have had several very satisfactory results from an operative procedure to which, we believe, insufficient attention has as yet been called. In three cases we have very carefully dissected the epididymis from the testis as far as possible, and have then turned down the latter organ—that is to say, revolved it around its horizontal axis, so that what was really the upper pole became the lower. By this means the cord may be lengthened from one-half to one inch. The fibres of the cremaster muscle around the spermatic cord must also be divided. It may then be possible to bring into the scrotum, without any tension on the cord, a testis which originally lay just outside of or within the external abdominal ring.

The case of primary sarcoma of the testicle which is abstracted below has some interest on account of the large secondary tumor in the retroperitoneal glands of the upper part of the abdominal cavity.

Torsion of Spermatic Cord; Hematoma of Testis; Castration; Cure.—Samuel D., 21 years of age, admitted February 8, 1902; discharged cured February 20, 1902. The patient gave a history of an undescended testis on the right side and a very freely movable testis on the left side. Six days before admission a swelling appeared in the left inguinal region, which slowly increased in size and became very tender. No fever, vomiting, or constipation. Temperature on admission, 101.8°, pulse 108. There was a tender mass, of about the size of a hen's egg, in the left inguinal region, irreducible, and giving no impulse on coughing. Below this and occupying the left side of the scrotum was a second mass, very tender and cystic. February 8: Operation: gas and ether anesthesia; incision over tumor in inguinal region. The upper tumor was found to be a much swollen and congested testis, hemorrhagic on account of torsion of the spermatic cord; the scrotal tumor was an inflammatory hydrocele. The spermatic cord was twisted around its axis for about 440 degrees. The testis was removed and the hydrocele drained; wound closed entirely except for small rubber tissue drain into tunica vaginalis at its most dependent portion. Convalescence was absolutely uneventful; the temperature fell to the normal within twenty-four hours of the operation; the wound was firmly healed and the patient discharged cured on February 20.

Sarcoma of Testis and Retroperitoneal Glands; Castration; Exploratory Laparotomy; Death from Exhaustion.—Charles E., 17 years old, admitted September 28, 1902; died October 24, 1902. Three months before, the patient noticed a swelling of the right testis, which slowly increased in size. Five days before admission the swell-

ing became much more marked. Patient lost nineteen pounds during the last three months. Physical examination showed that the man was very anemic and in poor condition; large, irregular tumor in the umbilical region, slightly movable from side to side; the right testis replaced by a tumor, of the size of an adult fist, slightly tender to the touch. October 14: Operation; castration; exploratory laparotomy. Tumor of testis proved to be a large, round-celled sarcoma; that of the abdomen, a tumor of the retroperitoneal glands; scrotal wound drained; abdomen closed. October 5: Injections of Coley's fluid begun; patient losing weight. October 16: Coley's fluid, twenty minims every day, without reaction; wounds doing well.

From this time on the patient gradually failed; he lost flesh and strength rapidly; the abdominal tumor increased in size; he died from exhaustion on October 24. Only a limited postmortem examination was permitted. The large tumor in the abdominal cavity consisted of sarcomatous retroperitoneal glands; the kidneys were pale but otherwise normal; the liver was studded with numerous metastatic deposits; the right chest contained some fluid (see pathological report No. 897).

OPERATIONS ON THE RECTUM, ANUS, AND ANAL REGION. TOTAL, 45; NO DEATHS.

	Totals.
Dilatation of sphincter ani for fissure	2
Incision and curetting of fistula in ano	9
Excision and suture of fistula in ano	2
" of papillomata of rectum	1
" " tuberculous sinus (fistula in ano)	1
Circular resection of prolapse of rectum	4
Incision and drainage of ischiorectal abscess	5
Hemorrhoids, clamp and cautery operation	15
" excision	2
" Whitehead's operation	4
Carcinoma of rectum, Rehn's vaginal operation	1

OPERATIONS ON UPPER EXTREMITIES. TOTAL, 16; NO DEATHS.

Amputation of finger for compound fracture	1
" " forearm for cellulitis	1
Plastic for traumatic defect of palm	1
Incision and drainage for phlegmon of forearm	3
Resection of ulna in continuity for manus valga	1
" " elbow for tuberculous arthritis	1
Incision and curetting for " "	1
Osteotomy for deformity of elbow following fracture	1
Tendon suture for lacerated wound	1
Thiersch grafting for burns of arm and chest	1
Excision of axillary glands	1
Incision of axillary abscess	1
Necrotomy for suppurating gumma of humerus	1
Incision and drainage of periarticular abscess of shoulder	1

Suppurating Gumma of Humerus; Necrotomy; Cure.—Joseph K., 44 years old, admitted July 6, 1902. Patient had had lues fifteen years before admission. He had received treatment for one and a half years. Two months before admission a painless swelling had been noticed on the outer side of the left arm. It had been incised and a little pus evacuated. The wound had not healed. The lower third of the left humerus was uniformly swollen, and along its anterior aspect, about two and one-half inches from the elbow, there was a sinus running upward. An incision was made down to the bone, necrotic material scraped away, and the bone chiselled wide of the necrotic process. The patient was discharged on July 14 with a rapidly healing wound. (*Note*—January 1, 1903: After his discharge from the hospital the wound promptly healed and patient has remained in good health.)

Tuberculous Arthritis of Elbow; Resection; Cure.—Annie S., 16 years old, admitted September 5, 1902. Two years before admission she had noticed that she could not fully extend the right arm. She had noticed nothing else until six weeks before admission, when the elbow became swollen, red, and tender. Plaster-of-Paris was applied for three weeks. The swelling then opened spontaneously and discharged a small amount of pus. A drainage tube was then introduced. On admission there was a profuse discharge of pus. The appetite was poor and the patient had lost weight. The right elbow presented a diffuse swelling extending up the lower third of the arm and down the forearm. The swelling was somewhat tender, especially over the posterior aspect. On the outer side of the joint there was a sinus which led into the joint. The arm could be passively extended for about fifteen degrees from the right angle. An incision was made on the outer aspect of the arm, beginning about two and a half inches above the joint, extending downward to an inch below the joint, then across the arm in a curved direction, terminating on the inner side of the ulna about one inch below the tip of the olecranon. The incision was carried down between the muscles on the outer aspect of the joint. On opening the capsule there was an escape of purulent material. Resection of the articular surfaces of the head of the radius and ulna, with partial removal of the olecranon, was done. The lower end of the humerus was removed on a line just above the epitrochlear prominence. The surrounding soft parts were curetted and necrotic tissue removed. The wound was flushed with 10 per cent. iodoform in ether. Gauze drainage to the inner and outer aspects of the joints, and suture of the skin. Immobilization of the suspended limb in extension. For several weeks following the operation there was a profuse purulent discharge from the wound. On October 3 the arm was put up in flexion at 90 degrees. On October 10 the sinus along the inner side of the arm was laid open and scraped. On November 12 there was about fifteen degrees of motion in the elbow. Patient was discharged on November

16 with a sinus on the inner aspect of the arm about one and one-half inches long. No bare bone could be felt. There was about thirty degrees of motion at the elbow. Power of extension was very good. Very little lateral mobility in the joint.

OPERATIONS ON THE LOWER EXTREMITIES—58; 6 DEATHS.

Hip—8; 1 Death.

	Totals.	Deaths.
Excision of hip for osteoarthritis	3	..
" " " " tubercular coxitis	1	..
Exarticulation at hip for osteomyelitis of femur	1	1
Incision and drainage " "	2	..
" " " " " of spine	1	..

Thigh—20; 4 Deaths.

Incision and drainage of phlegmon of thigh	1	..
" " " " abscess " "	4	..
Osteotomy for deformity after old fracture	1	..
" " osteomyelitis of femur	4	..
Amputation for sarcoma " "	1	..
" " embolic gangrene of foot	1	1
" " Reynaud's disease	1	..
" " diabetic gangrene	2	2
" " arteriosclerotic gangrene	1	..
" " " " secondary	1	1
Excision of lipoma of thigh	1	..
" " sarcoma of fascia lata	2	..

Knee and Leg—19; 1 Death.

Aspiration of knee for acute synovitis	1	..
Arthrectomy for tubercular arthritis of knee	1	..
Mayo's operation for osteoarthritis " "	1	..
Incision and drainage of prepatellar bursitis	1	..
Excision of tubercular ulcer of leg	1	..
" " varicose veins	1	..
Osteotomy for osteomyelitis of tibia	4	..
" " genu varum	2	..
" " " valgum	2	..
Amputation of leg for diabetic gangrene of foot	1	1
" " " " gangrenous cellulitis of foot	1	..
" " " " arteriosclerotic gangrene of foot	1	..
Reamputation	1	..
Revision of amputation wound	1	..

Foot—11; No Deaths.

Incision and drainage of phlegmon of foot	2	..
" " " " osteomyelitis of tarsus	1	..
Tenoplasty for talipes equino-varus	1	..
Phelps' operation for talipes equino-varus	1	..
Cotting's operation for ingrown toenail	1	..
Osteotomy for hallux valgus	1	..
Amputation of toe for arteriosclerotic gangrene	1	..
" " " " osteomyelitis	3	..

The high mortality after operations for diabetic gangrene of the lower extremities has determined us to be more conservative in our making of the indications for operation. During the past year we have seen three cases on our service of rapidly advancing diabetic gangrene of the lower extremities. All three of the patients were septic when they entered the hospital; in all immediate high amputation was done, but all three succumbed to their disease. Of three cases of arteriosclerotic gangrene of the lower extremities where high amputation was done, two recovered. All the amputations were widely drained. In all of the patients there was more or less secondary marginal necrosis of the skin, the flaps being composed of skin and muscle, although the most scrupulous care was taken to avoid all pressure upon the soft parts and to favor the circulation as much as possible. All of the cases occurred in adults in the prime of life, but in all the healing of the wounds was extremely slow. One of the cases required reamputation.

Arteriosclerotic Gangrene of Lower Extremities; Amputation of Leg; Amputation of Thigh; Death.—Rubin G., 33 years of age, admitted October 27, 1901. Four years before, amputation through the lower third of the right leg had been done on account of gangrene. Six weeks before admission to the hospital gangrenous areas had appeared on the dorsum of the left foot. The gangrenous process soon extended over the entire foot. Physical examination showed that the arteries all over the body were much thickened and that the femoral pulses were barely perceptible. Temperature 102°, pulse 124. October 28: Amputation through upper third of leg with lateral flaps; wound treated by the open method. During the following three days the temperatures fluctuated between 102° and 104.6°, the pulse between 120 and 130. The wound was examined on the second day and a beginning gangrene of the skin flaps noted. As the gangrene showed no tendency to become limited, amputation through the middle of the thigh was done on the following day. There was very little bleeding during the operation. The femoral artery was very small and its walls thickened and calcified. The skin flaps were left wide open. After the operation the pulse and temperature remained high, the amputation wound showed no tendency to heal, the skin flaps again became gangrenous, and the patient's general condition became much worse. At the same time areas of gangrene appeared on the other leg and knee and on the right wrist and fingers; deep and rapidly spreading bedsores appeared on the patient's back; he developed a loud heart murmur over the mitral area; he became delirious. In this condition he remained for several weeks, but further operative interference was considered out of the question. Death occurred on January 7, 1902. Post-

mortem examination was not permitted. Microscopical examination of the upper part of the femoral artery of the amputated limb showed that there was a very advanced endarteritis with calcareous and other degenerative changes in the middle and outer coats; the lumen of the vessel was almost entirely obliterated.

Embolic Gangrene of Leg; Chronic Endocarditis; Septicemia; Amputation of Thigh; Death.—J. B., a woman 23 years old, was admitted June 10, 1902, with a history of cardiac disease of four years' standing. Three weeks before admission the patient suddenly felt that her left leg became numb. The numbness persisted until ten days later, when the foot began to turn black. The discoloration slowly spread over the entire foot. On admission the temperature was 104°, pulse 120; there were the physical signs of advanced myocarditis; gangrene of entire left foot and lower posterior part of lower third of leg; fairly distinct line of demarkation; femoral pulsation well marked. June 10: Operation: amputation through middle third of thigh by circular incision; wound edges approximated with zinc plaster straps; free drainage. Examination of the amputated limb showed that there was a thrombus at the lower part of the popliteal artery just above its bifurcation and extending downward into the arterial branches. The femoral was the seat of fairly marked degenerative changes. For two days after the operation the patient's condition improved somewhat and the temperature remained lower; examination of the wound showed that it was in good condition. On the third day after operation her condition became suddenly worse, the temperature again began to rise, the heart action became more rapid and feeble, and in spite of vigorous stimulation she died on the evening of the fourth day after the operation. Postmortem examination was not permitted.

Arteriosclerotic Gangrene of Leg; Amputation of Thigh; Cure.—Abraham E., 32 years old, admitted May 10, 1902. The patient had had occasional attacks of pain in the right leg for four years. For four months the great toe had been red and swollen and a small ulcer had appeared. For two days the toe had been gradually becoming black. On admission the man's temperature was 102°, his pulse 104, the entire great toe was gangrenous, the extensor tendons exposed; the foot was red and swollen. Soon after the patient's admission to the hospital he was taken to the operating room and the toe amputated, the wound left widely open, and a wet dressing applied. On the day following the temperature rose to between 105° and 106°, and the pulse to 120. Examination of the wound showed that the gangrene had extended up on the foot, with lymphangitis to the knee. May 13: Amputation of thigh through its lower third; circular incision; little bleeding from stump; femoral artery the seat of advanced disease; wound edges partly approximated by zinc plaster strips and freely drained. Thereafter convalescence was uninterrupted; the temperature dropped to the normal within three days; the wound

healed slowly but granulated well; the patient was discharged cured on June 2, 1902.

Diabetic Gangrene of Foot; Amputation; Death.—Julius S., 59 years of age, admitted September 9, 1902; died September 12, 1902. The patient, who had suffered from diabetes for over one year, had had a sore on the left great toe for four months, and increasing gangrene of the left foot for three weeks. Seven hours after admission the leg was amputated at its lower third and freely drained. Urine contained casts, three and one-half per cent. of sugar, but no acetone or diacetic acid. The patient, who was in a septic condition when he was brought to the hospital, grew steadily worse until death occurred three days later. No postmortem examination was permitted.

Diabetic Gangrene of Foot; Amputation of Thigh; Death.—Bernard A., 59 years old, was admitted on January 18, 1902, in very poor condition, with a diabetic gangrene of the left great toe and part of the foot, a temperature of between 103° and 104°, and a pulse of 140. The urine contained three per cent. of sugar and acetone, but no diacetic acid. January 19: Amputation through middle third of thigh under nitrous oxide anesthesia; wound left open. On the day after the operation the patient became comatose, the temperature rose to over 105° and the pulse to 140. He died the same evening. No autopsy.

Diabetic Gangrene of Foot; Amputation of Thigh; Death.—Mr. I. G. was admitted as a private patient January 23, 1902, with a diabetic gangrene of several toes and part of the left foot. His temperature was 100.8° and his pulse 134. The urine contained four per cent. of sugar and acetone, but no diacetic acid. The left thigh was amputated at its middle by a circular incision. The patient did poorly after the operation; the pulse remained weak and did not respond to stimulation. Four days after the operation he was dressed, a few whiffs of nitrous oxide gas having been administered. He died immediately after the dressing. The wound looked extremely well, but the death was due to cardiac failure from sepsis. No autopsy.

Osteomyelitis of Femur; Arthritis of Hip Joint; Resection of Hip; Chronic Septicemia; Exarticulation at the Hip; Death.—Samuel K., 53 years old, admitted August 26, 1901; died January 26, 1902. Six months before, the patient had fallen and injured his hip. He was treated by immobilization and extension of the hip for several months without much benefit, as considerable pain in the hip remained. Since that time the patient had been able to walk only with the greatest difficulty and had suffered much pain. When admitted into the hospital he was in fairly good condition; pulse and temperature normal; the left leg considerably atrophied and held in a position of external rotation. Abduction and internal rotation was limited, and joint crepitus was very marked. On August 31 the left hip joint was resected through an anterior incision, considerable dis-

eased bone removed, and the joint drained. After a few days there was a profuse discharge from the joint, which persisted in spite of frequent dressing and seemed to weaken the patient very much. November 19: The joint was again freely opened and the head of the bone, which lay free in the joint cavity, removed, and the joint drained. Considerable improvement at first followed the operation, but the profuse purulent discharge soon returned. Several counter incisions were then made for drainage, but the profuse discharge from the joint cavity persisted. As the patient was emaciating and becoming very weak and anemic, and since he was running a septic temperature, it was decided to exarticulate the femur at the hip joint. In order that the operation might be done very rapidly, and since the patient's extreme emaciation made it possible, pressure was made upon the abdominal aorta by an assistant and the operation made an almost bloodless one. Rapid exarticulation was then done, the patient being infused during the operation. The acetabular cavity was found much disintegrated and surrounded by pockets of pus. There was much outgrowth of new bone from the pelvis all around the joint, adding considerably to the difficulties of the operation. The patient stood the procedure very badly. He was severely shocked and, in spite of energetic stimulation, died a few hours later. No autopsy.

Compound Fracture of Pelvis; Fracture of Skull; Sepsis; Removal of Splintered Bone from Pelvic Wound and Drainage; Death.—Annie W., 2 years old, was admitted on September 18, 1902, having been run over by a heavy wagon seventeen days before, with injury to the bones of the pelvis and skull. The child was admitted to the hospital with a temperature of 103° and a pulse of 130, with signs of meningitis, and a large, irregular infected wound over the left pubic bone, with bare bone exposed. As the child was in very poor condition, very little could be done; the pubic bone was exposed by an incision, a fracture of the horizontal ramus found, some loose pieces of bone removed, and the wound drained. The little patient did not rally after the operation. She grew gradually weaker and died the following day. The postmortem examination showed that there was double compound fracture of the pubic bones without injury to the viscera, and a fracture of the skull involving the right occipital fossa and extending into the foramen magnum. The cerebellum was somewhat lacerated.

SKIN GRAFTING—15.

	Totals
Thiersch, of abdominal wall	1
" " buttock	3
" " back	1
" " arm	2
" " chest wall	2
" " leg	4
" " thumb due to cicatricial contraction	1
By skin flap from buttock, of hand	1

Good success has been attained in the Thiersch grafting by the employment of dry dressings. Successive *single* layers of gauze, about six in all, are placed over the grafted surface, and upon these layers is placed an elastic pad of gauze, then non-absorbent cotton, and finally a well-fitting, very snug bandage. There is no maceration of the flaps and the elastic compression causes them to adhere very perfectly. Care must be exercised at the first dressing, four days after the operation, lest the grafts be detached by too roughly removing the dressing. Each one of the original gauze layers must be removed separately.

MISCELLANEOUS—12; 1 DEATH.

	Totals.	Deaths.
Curetting for endometritis	2	..
Cauterization of carcinoma of cervix uteri	1	..
Hysterectomy for fibroids of uterus and ovarian cyst	1	..
" " carcinoma of uterus	1	1
Salpingo-oöphorectomy for tubo-ovarian abscess	1	..
Incision and drainage of intraligamentous cyst	1	..
Oöphorectomy for ovarian cyst	1	..
Incision and drainage for pelvic peritonitis	1	..
Excision of epithelioma of perineum	1	..
Removal of foreign body from buttock	1	..
" " sutures from sinus of groin	1	..

The following case of tubo-ovarian abscess secondary to acute appendicitis possesses some features of interest. The patient was a young virgin who had been operated upon for an acute perforative appendicitis seven months before, at which time the right tube and ovary had been examined and found normal. This case would seem to give additional proof, if such were necessary, that disease of the tube and ovary can just as well occur secondary to disease of the appendix as inflammation of the latter organ can follow affections of the right Fallopian tube and ovary.

Tubo-ovarian Abscess Secondary to Acute Appendicitis; Salpingo-oöphorectomy; Cure.—Annie K., single, 17 years of age, was admitted on September 12, 1902. The patient had been operated upon in the hospital for acute appendicitis seven months before, at which time the ovaries and tubes had been examined and found normal. The wound had been drained. Soon after the patient left the hospital she began to have pain in the lower part of her abdomen, which gradually increased in severity. The pain had of late been localized in the cicatrix of the former operation. On the day before her readmission she had had a severe chill. When she entered the hospital there was marked tenderness over the region of the old scar, but no tumor palpable; temperature 103.4°, respiration 36, pulse 158. Opera-

tion was performed soon after the patient's admission. The abdomen was found to contain clear fluid; the right tube and ovary were found to be adherent to the pelvic wall in the neighborhood of the cecum and to be filled with pus. The tube and ovary were removed and the pelvis drained. The temperature and pulse fell to the normal within forty-eight hours and convalescence was absolutely uneventful. The wound was entirely healed and the patient discharged cured on October 25.

Although it is by no means proven that in this instance the disease was secondary to the appendicitis, no other cause was discovered.

Carcinoma of Uterus; Abdominal Hysterectomy; Death.—Mrs. Mary R. was admitted as a private patient on June 30, 1902, with an advanced carcinoma of the cervix uteri. Abdominal hysterectomy was done on June 4. On the following day the patient developed a pneumonia of the lower lobe of the right lung, to which she succumbed on June 9. No autopsy.

Streptococcus Pyemia; Multiple Abscesses; Incision of Abscesses; Cure.—Mary D., 12 years of age, admitted March 7, 1902; transferred to the surgical service from the children's service of Dr. Koplik on April 4, 1902. The child had been sick for eight weeks with all the characteristic symptoms of pyemia following suppurative middle-ear disease. Pus had been evacuated from both mastoid regions at a previous operation. The blood contained the streptococcus pyogenes in pure culture. The patient had become much emaciated; the temperatures had ranged between 100° and 106°, the pulse between 90 and 130. Subcutaneous abscesses had appeared in various parts of the body and had been opened. On April 4 a large, tender swelling appeared in the left groin and the abdomen became distended and generally tender. When the patient was transferred to the surgical service she was very much emaciated; temperature 104.8°, pulse 124. A large abscess in the region of the left groin was opened and drained. The abscess extended between the layers of the abdominal wall into the left lumbar region. The pus contained the streptococcus in pure culture. Very little improvement followed the operation; the pulse and temperature remained high. April 15: Wounds over mastoid regions healing; profuse discharge of foul pus from wound in groin; large decubitus over sacrum; high temperatures persist; counter-incision in left lumbar region for better drainage; large abscess in left iliac fossa opened under ether and drained. April 24: High temperatures have persisted; emaciation extreme; large abscess in left buttock opened and drained; blood culture as well as culture from pus shows streptococci. May 13: During the past three weeks the patient's condition has grown steadily worse; abscesses were opened in left buttock, left arm, and left leg; the discharge from all the abscess cavities was profuse and the wounds showed no tendency to heal; the bedsores over the sacral region had increased in size in spite of all treatment.

On May 13 the temperature for the first time dropped to 100°, at the same time that the discharge from all the wounds became less; blood culture was negative for the first time. After several counter-incisions had been made for better drainage, the several wounds began to granulate. Thereafter improvement was slow but steady; the patient took large quantities of solid food; she began to gain flesh and strength. The temperature reached normal for the first time on May 29. From this time on improvement was rapid. By July 1 all the wounds were healing well and the patient had gained much flesh and strength. Thereafter convalescence was uninterrupted. The patient was discharged cured, with all the wounds healed, on August 23.

INCISION AND DRAINAGE—31; NO DEATHS.

For Phlegmon—16.

	Totals.
Arm	3
Forearm	1
Hand	5
Knee, periarticular	1
Leg	2
Foot	4

Abscess—14.

Axillary	4
Shoulder, periarticular	1
Lumbar	2
Inguinal	2
Thigh	2
Buttock	1
Leg	1
Multiple pyemic	1

Carbuncle—1.

Back	1

Incisions with drainage were made a large number of times secondary to various operations, but are not noted here.

CAUSES OF DEATH, SECOND SURGICAL DIVISION. TOTAL, 81.

	Operation.	No operation.
Abscess of nose; meningitis; pneumonia	1	..
" " brain	1	..
Acute osteomyelitis of humerus	..	1
" " " inferior maxilla	1	..
" " " femur and ilium	1	..
" suppurative ethmoiditis; sepsis	..	1
" intussusception	4	1
" intestinal obstruction	4	..
" " " internal hernia	1	..

	Operation.	No operation.
Adenitis, submaxillary and cervical	1	..
Appendicitis, acute gangrenous	1	..
" " " abscess	2	..
" " " general peritonitis	4	..
" " " intestinal obstruction	1	..
" " " multiple abscesses	1	..
" abscess	1	..
Cecum, inflammatory tumor of	1	..
Carcinoma of colon; peritonitis	1	..
" " descending colon	1	..
" " sigmoid flexure; myocarditis	1	..
" " rectum; general carcinosis	1	..
" " colon	1	..
" " rectum; intestinal obstruction	1	..
" " prostate and bladder	1	..
" " stomach	2	..
" " cervical glands, secondary	..	1
" " uterus; pneumonia	1	..
" " breast; general carcinosis	1	..
Colitis, chronic ulcerative; sepsis	1	..
" " " abscess of lung; suppurative portal thrombosis	1	..
Foot, diabetic gangrene of	3	..
Hernia, strangulated femoral	1	..
Imperforate anus and rectum	1	..
Intestinal perforation; typhoid fever	3	..
Kidney, hypernephroma of	2	..
" chronic inflammation of; sepsis	1	..
Leg, diabetic gangrene of	1	..
" embolic " "	1	..
Liver, abscess of	2	..
" cirrhosis of	1	..
" abscess of; suppurative portal thrombosis	1	..
" multiple abscesses of	1	..
Cholangitis	1	..
Cholelithiasis; cholecystitis; peritonitis; anuria	1	..
" shock	2	..
Empyema of gall bladder; peritonitis	1	..
Pelvis, compound fracture of; sepsis	1	..
Peritonitis, tuberculous	2	..
" general purulent	4	1
Pyonephrosis, staphylococcemia	1	..
Prostate, hypertrophy of; pyemia	..	1
" carcinoma of	1	..
Shock from extensive burns	..	1
Testis, sarcoma of	1	..
Thorax, empyema of	1	..
Volvulus of sigmoid flexure	2	..

HYPERPLASTIC COLITIS: EXTIRPATION OF THE ENTIRE COLON, THE UPPER PORTION OF THE SIGMOID FLEXURE, AND FOUR INCHES OF THE ILEUM.[1]

By Howard Lilienthal, M.D.,

ATTENDING SURGEON.

The following history is a singularly remarkable one, not only because of the final recovery after many very dangerous intra-abdominal operations, but because of the surgical surprises which were encountered throughout the entire progress of the case.

The patient, a girl of 21, was referred to the surgical department of Mount Sinai Hospital by Dr. Manges, who had observed her for some days in the medical side of the institution. She had for years suffered from diarrhea, accompanied by hemorrhages and the passage of foul mucus, and finally became so weak and anemic that a left inguinal colostomy had to be performed to give rest to the lower portion of the colon and rectum. The surgeon who opened the colon at this time saw that the walls of the viscus were covered with polypoid growths which bled easily even on gentle manipulation. The patient was very much benefited by the operation, the hemorrhages finally ceasing, so that it was thought best to close the artificial opening. No sooner had she left the hospital, however, than her old trouble returned in all its severity and the girl became once more profoundly anemic and very weak. She then first came under my care. She had as many as twelve stools a day. There was much abdominal pain and some vomiting. The diarrhea and bleeding were worse after the ingestion of certain articles of food; she could not eat meat at all. On examining the abdomen considerable tympanites was noted, but no distinct mass could be felt. Examination of the rectum disclosed the presence of several small polypoid masses. I determined, on account of the inability of the surgeon to reach the upper limits of the disease with the finger through the original colostomy wound, to open the caput coli through a wound in the right iliac region, in order to give the entire colon as thorough functional rest as possible. This operation was performed on December 30, 1899. I found the colon here in much the same condition which had been noted in the descending colon. There was no normal mucous

[1]Reprinted from American Medicine, April, 1901.

membrane, the entire mucosa being covered by large and small papilloma-like excrescences. One of these was removed for examination and proved to be an hypertrophied solitary follicle (examination by Dr. F. S. Mandlebaum, pathologist). Incidentally the vermiform appendix was removed at this time. Its mucosa was hyperplastic. I will not go into the details of the treatment, but will simply say that everything which in my mind promised success was tried—nitrate of silver injections and irrigations, saline irrigations, etc. The patient rapidly improved in her general condition, the hemorrhages almost entirely ceased, but it was evident that the closure of the right colostomy wound would surely be followed by the recurrence of her trouble, since the condition of the visible mucous membrane was unchanged. I therefore made up my mind that the exclusion of the entire colon from the alimentary tract promised the greatest relief with the least degree of risk. Accordingly, on March 6, 1900, the operation of end-to-end ileosigmoidostomy was performed. Through a median incision the ileum was sought out and divided about four inches from the ileocecal valve. The intestine here was observed to be healthy. The

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 1.—A, colostomy. FIG. 2.—A, continuity restored. FIG. 3.—A, right colostomy and removal of appendix.

lower end of the ileum, that adjoining the ileocecal valve, was closed by invagination with the help of a purse-string suture of silk. The sigmoid flexure was then drawn into the wound, and was in turn divided somewhere in its lower half, its upper portion being also invaginated by means of a heavy purse-string suture. The lower portion of the sigmoid was then united by Murphy's button with the upper portion of the ileum, so that the intestinal contents would pass directly from the ileum into the lower half of the sigmoid flexure, which was comparatively healthy. A drainage wick was left in the lower angle of the wound, the remainder being closed by sutures. The right iliac colostomy was, of course, not disturbed, because it was understood that a vent for the secretions of the excluded portion would be necessary. The patient was kept quiet with opium following this operation. Full stimulation was necessary, as there was considerable shock. The urine on March 10 showed the presence of albumin and casts. The patient was then having numerous small involuntary liquid stools. There was a large amount of exceedingly foul discharge from the right iliac wound, and it was necessary to

wash out the excluded colon several times a day with a long rubber tube passed as far as possible into the lumen of the gut. On March 19 the Murphy button was extracted from the rectum with forceps. The patient's general condition at this time was greatly improved, although she still had ten or fifteen stools a day. On March 26 the number of stools had fallen to about nine a day.

I was now surprised to learn that the irrigation through the colostomy wound seemed to act as an enema, the patient insisting that the water injected through this wound was passed by the rectum. Irrigations with methylene-blue solutions showed that this indeed was the case. At first I could hardly believe such a thing possible, but afterward came to the conclusion, in the face of the stubborn fact itself, that a tract of suppuration must have formed between the site of the anastomosis and the invaginated end of the sigmoid. It certainly was an example of the wonderful way in which Nature tries to re-establish normal conditions.

The patient now rapidly improved. The discharge from the colon became less and less, and I was perfectly willing to consider the case

FIG. 4.

FIG. 5.

FIG. 4.—A, invaginated end of ileum; B, anastomosis of ileum with sigmoid; C, invaginated end of sigmoid.

FIG. 5.—The shaded portion was removed in one piece; arrows show direction of traction to evert stump excised at the final operation.

ended so far as I was concerned. I had been cauterizing the visible mucous membrane of the colon in the right iliac region, using the Paquelin cautery, with the hope of causing the formation of cicatricial tissue so that there would be no annoyance from the wet, everted mucous membrane. The patient insisted, however, that she would not be satisfied until the opening was closed. Knowing that the only way which promised success would be the total extirpation of the colon and the stump of the ileum, I hesitated to gratify her wish. Still, on considering the matter, I believed that this operation might, after all, be feasible, in view of the fact that the colon was already, so to speak, out of commission. Then, too, the mucous membrane had not atrophied and still bled at the lightest touch, so that I was obliged to consider the probability that it would become the seat of malignant degeneration. I therefore consented to operate once more.

On June 15, 1900, a median incision at the site of the old scar was once more made. The first point sought out was the region of the

anastomosis between the ileum and the sigmoid. I found here a fibrous cord, over an inch long, connecting the invaginated end of the sigmoid with the point of anastomosis. On dividing this a central channel was found which explained the appearance of the methylene-blue solution in the stools after its injection into the colon. This cord was cut off flush with the anastomosis, the place was inverted into the intestine, and the opening closed with a few Lembert sutures. The line of the button anastomosis was very perfect and there was no induration. Beginning now at the sigmoid flexure, numerous ligatures were passed through the mesocolon, the extirpation coincidently proceeding. The patient's condition became somewhat critical, and in order to save time I was obliged to take large masses in the grasp of each ligature. At about two and one-half inches from the colostomy wound I cut off the colon and removed it from the abdomen. A long forceps was now inserted from without through the colostomy wound, and the end or stump of the colon was grasped and withdrawn, thus everting the stump. I tried to treat the stump of ileum, which had shrunk to about two and one-half inches, in a similar manner, but was unable entirely to evert it. With one hand in the abdomen I guarded against possible protrusion or prolapse of a loop of intestine into the funnel of the everted colon. At the same time I ligated with a heavy piece of silk the entire everted stump, cutting away the external redundancy. The median incision was now closed by sutures, a gauze drain being left in its lower angle and another passed down to the right flank where there had been some bleeding. The patient reacted well after the operation, but on the following day she developed a pneumonia of the right side at the base. It yielded to treatment. There must have been infection at this operation, for an abscess formed beneath the median wound, through which foul-smelling pus and apparently fecal matter but no gas were discharged. On the fourth day I encountered another surprise in the appearance of a distinct fecal discharge from the right iliac wound, the ligature having come away. This I was at a loss to explain. My finger in the abdomen had carefully guarded against prolapse of the intestine at the time the ligature was tightened, and yet I could only account for the appearance of feces at this point by assuming the prolapse of a knuckle of intestine which was strangulated by the tightening of the ligature. On June 27 there occurred a spontaneous rupture of a large abscess at the site of the old left colostomy wound, and the evacuation of the pus was accompanied by the discharge of a piece of gangrenous mesocolon with five or six chromicized catgut ligatures still in place upon it.

With varying fortunes all the wounds finally healed with the exception of the fistula in the right side. Realizing that this would not close without another operation, I excised the entire cicatrix and fistula on October 6, expecting naturally to come upon the loop of small intestine, which it was my intention to excise, anastomosing the

ends. What was my astonishment to find a single piece of intestine, *not a loop*, passing directly to the fistula. A large probe passed in at the fistula was seen traversing the lumen of this intestine. The intestines were matted together in many places, but it was possible to explore easily for fully ten inches along this gut without encountering adhesions. Not wishing to place the patient in further danger for the sake of satisfying my curiosity, and knowing that she had passed but a very small portion of the daily quantity of feces through the fistula, I merely cut off this piece of intestine and invaginated it, then closed the wound by suturing, with drainage.

The result has been most gratifying. All the wounds are now closed, and I believe I have finally seen the last of this most interesting but perplexing case. I am absolutely unable to explain the condition of things present at the final operation.

The patient was shown at a meeting of the Section on Surgery of the New York Academy of Medicine on January 14, 1901. At that time there was a pinhole sinus in the right iliac region, but it has now (April 16) closed. The patient is in excellent general health and has two movements a day. The stools are usually semi-solid, but are sometimes formed.

SUPRAPUBIC CYSTOTOMY IN OPERATIONS UPON THE PROSTATE.*

By Howard Lilienthal, M.D.,
ATTENDING SURGEON.

"In the present state of our knowledge, hypertrophy of the prostate is not curable by any means that have yet been used." This statement will be found in the 1884 edition of Van Buren and Keyes.[1] By it we may understand that the unfortunate sufferer from an extremely common disease had to resign himself as best he could to a life of continued invalidism with the prospect of fatal complications staring him continually in the face. I will not here attempt the description of such a miserable existence. It is bad enough when a man advanced in years and feeble becomes thus a burden to himself, but when one considers how those in their prime, vigorous in mind and body, may be compelled all too soon to say of active, useful life, "It is finished," and to give up the occupations and pleasures which they loved, it is small wonder that the spirit of rebellion is strong within them, and that no sacrifice is too great, no risk too hazardous, if it but holds out a promise of relief.

At a meeting of the Clinical Society of London, held in the year 1887, Sir Henry Thompson[2] reported a case in which, after repeated surgical procedures, he was gratified to present as a result of his endeavors a patient with a permanent suprapubic fistula. By means of a tube the leakage was controlled so that the man was fairly comfortable. Such instances are far from rare in surgical literature, and various devices have been contrived to render the fistula a tolerable burden. At the same meeting, and following Thompson's communication, McGill[3] reported three cases in which he had removed prostatic obstructions by the suprapubic route, with the brilliant result that his patients were able to pass their urine in a normal manner. The accidental removal of obstructing portions of the prostate during the performance of perineal lithotomy had been occasionally reported,

*Read before the New York Surgical Society at its regular meeting, November, 27, 1901. Reprinted from Medical Record, January 18, 1902.

with the information in a number of cases that there was considerable improvement in the condition. Länderer,[4] after such a fortunate accident in which he took away a median lobe together with the stone for which he was operating, suggested that the procedure might well be more generally adopted. Belfield, Gouley, and other surgeons have with varying success removed obstructions by cutting them away with specially constructed scissors and forceps, and finally White and Harrison were responsible for the thorough testing of double orchidectomy and vasectomy.

Still, success with perfect function was the great exception, and the catheter had to be resorted to more or less in most instances. Finally, Fuller began the systematic enucleation of fibrous, myomatous, and adenomatous prostates in 1894[5] with excellent results, while the achievements of Alexander and others working through the perineum, and the revival of the Bottini operation of electrocaustic prostatotomy, caused the entire subject to receive renewed attention. Yet, so late as last year, P. J. Freyer[6] in a paper on perineal prostatectomy shows a strange lack of confidence in the radical cure of senile enlargement of the prostate by remarking that "the vast majority of cases . . . are . . . best treated by careful, cleanly, and judicious catheterism"—an opinion which will hardly be shared by those who have seen the ideal results obtained with the aid of operative treatment.

I have performed the operation of suprapubic enucleation of the so-called hypertrophied prostate seven times, with one death, one failure, and five complete cures. In addition I have operated a number of times for other diseased conditions of the prostate, but these cases will not be considered here.

Case I.—The first patient, R. L., upon whom I attempted to perform prostatectomy was a very corpulent man, 66 years of age, who had had suprapubic cystotomy done by me some months before because of acute retention with urinary sepsis. The enucleation was attempted on August 26, 1896. At the first operation he had taken the anesthetic so miserably, owing to asthma from pronounced emphysema, that I resolved to do what I could with the help of eucaine injected into the vesical mucous membrane covering the prostate. There was so much straining, however, during the operation, and the abdominal walls were so enormously thick, that I was obliged to desist after removing two adenomatous growths about as large as filberts. The man's condition was practically unimproved, and he now wears a glass tube which keeps him pretty dry during the day, but is forced to use thick gauze pads at night.

Case II.—H. M., 65 years old, had been troubled for years with renal colic and the symptoms of vesical calculus. Occasionally a small round stone, about the size of a pea, was passed by urethra. November 5, 1896, he was suffering from acute retention with genito-urinary sepsis following instrumentation. I operated on November 12, during the acute attack, the sepsis having proved intractable to the usual forms of treatment. Eighty-five small round stones were removed through a suprapubic vesical incision, and at the same time the enlarged and obstructing prostate was enucleated, a procedure which I believe should have been undertaken at a second sitting in this case. The urine could not be satisfactorily examined as to the condition of the kidneys, on account of the large amount of blood present, probably the result of the instrumentation. The operation was not a difficult one, but the patient died within twenty-four hours, his sepsis unchecked. No autopsy permitted.

The next case came four years after the one just reported.

Case III.—I. L., 74 years old, but in excellent physical condition except for his local disorder, had been afflicted with the burden of "catheter life" for twenty-two years, during which time not a drop of urine had been voided naturally. Several attacks of cystitis and epididymitis had threatened the patient's life with urinary sepsis, but had yielded to treatment. At the age of 70 I had castrated him during an acute attack, with some relief, but without any change in the obstructive condition. At last the exacerbations began to occur with greater frequency, and while he was convalescing from one of them I performed suprapubic section with enucleation of the prostate and perineal drainage on September 25, 1900. A ball-valve median and two enlarged lateral lobes were easily shelled out. The combined mass weighed 41 gm. Hemorrhage was slight and post-operative shock absent. Recovery was quick, complete, and apparently permanent, for the man remains absolutely well now, more than a year afterward. His stay in the hospital was twenty-three days. Although not strictly relevant, it is interesting to note that there were disagreeable nervous symptoms, apparently connected with the orchidectomy, such as sleeplessness and hot flushes, and that these phenomena promptly and entirely vanished on the internal administration of orchitic substance, and that the patient had not the remotest idea of the nature of the medicine he was taking.

Case IV.—J. R., 58 years old, had had two attacks of gonorrhea when he was 18 years of age, and an initial lesion with secondaries at 28. Until his fifty-third year his history is otherwise negative, but at that time he began to have increased frequency of micturition, noticed especially at night. He was first catheterized about the middle of May, 1901, when his physician noted that there was residual normal urine to the amount of seven ounces. Regular cathe-

terization was instituted, and five weeks before I saw him there developed a severe cystitis, accompanied by left epididymitis. On July 3 I had Mr. R. admitted to Mount Sinai Hospital. At that time there was no fever, and pulse and respiration were normal. The urine contained a trace of albumin and considerable pus, in spite of the fact that he had been under the usual preparatory treatment for several days. On July 4 I operated, and on opening the bladder from above noted that there was a large prostatic mass projecting over the internal urethral orifice from above, and that the remainder of the gland was very much enlarged, as one would have been led to suppose from the rectal palpation. The anterior portion was first removed by enucleation, and then three other masses were taken away, and the operation concluded without perineal drainage. Hemorrhage was moderate and easily controlled. The subsequent course of the case was uneventful and the patient was discharged from the hospital well, except for a granulating suprapubic wound which has since closed. The recovery is perfect, and the functions of micturition and coition apparently normal.

Case V.—M. G., 58 years old, had suffered for two years with frequent micturition and finally with retention and overflow. On May 26, 1901, when he first came under my observation, there was marked cystitis with fever. Catheterization with the rubber instrument was impossible, but a woven Mercier passed a distinct obstruction at the neck of the bladder with comparative ease. The prostate was felt to be enlarged, on examination with the finger in the rectum; but the complete retention led me to suppose that we had to deal with a middle lobe. Operation was proposed and accepted. After two days of preparation with frequent catheterization and diuresis, the suprapubic section was done at Mount Sinai Hospital. There was still considerable urinary sepsis, the temperature rising as high as 102°. Thirty-six ounces of urine were passed on May 27, the day before the operation, and there was but 1.2 per cent. urea, the specific gravity being 1010. There was a trace of albumin, accounted for by the presence of pus; but there were no casts. At the operation the bladder wall was found considerably hypertrophied, and there was a large sacculation in its upper right portion. A middle lobe, the size of a marble, pedunculate, and acting as a ball valve, was easily enucleated. The remainder of the prostate, though somewhat enlarged, was fibromyomatous in character and could not be enucleated. I assured myself that the obstruction had been perfectly relieved by passing a very soft rubber catheter into the bladder through the urethra, and concluded the operation without perineal drainage. There was practically no reaction, and convalescence was ideal. The patient was discharged on July 8, passing all the urine in his bladder at each micturition, and apparently well. Since his discharge from the hospital he has enjoyed sexual congress in an apparently normal manner.

Case VI.—J. R., 60 years old, entered Mount Sinai Hospital in June, 1900, with a characteristic history of senile prostatic enlargement dating back a number of years. The immediate cause of his seeking admission was severe hematuria with great vesical distress. The patient was quite feeble, and suprapubic cystotomy for drainage seemed to be all that he would safely stand in the way of operative therapy. Dr. Brewer, at that time adjunct surgeon, operated for me, and found that in addition to a considerable prostatic enlargement, which could be felt by rectum, there was a distinct pedunculated middle lobe which he was tempted to remove. On account of my suggestion that drainage would probably be all that the patient would safely endure, the operation was completed by the insertion of a tube, and the man was sent back to bed, where continuous vesical siphonage was instituted. Recovery with very great improvement followed, and in a few weeks, the suprapubic sinus having closed, the patient was taught to catheterize himself and was discharged. He re-entered the hospital on May 16, 1901, suffering with dangerous bleeding from the urethra after an attempt at catheterization. Besides the occasional reopening of the suprapubic fistula, the patient, with frequent catheterization, had been quite comfortable until the hemorrhage, which had begun five days before his readmission, and had continued the entire time with varying severity. There was no fever. The urine was so bloody that it could not be properly examined. Cystitis, if present, was not severe. A soft-rubber catheter could not be passed, but a silk Mercier entered the bladder apparently through a false passage in the floor of the urethra. Some urine came through the suprapubic opening. Under the influence of urotropin and frequent catheterization, together with the injection of nitrate of silver solution 1:750, the hemorrhage ceased, excepting on attempts at voluntary micturition, when the urine was always of a bright-red color. On May 25, nine days after admission, I operated, employing nitrous oxide and ether anesthesia. The old scar with the sinus was excised, and the peritoneum wounded during the procedure. The opening was closed by continuous suture, and a piece of gauze laid over the line of union, further to protect the abdominal cavity. The prostate was enucleated in three masses weighing in all 66 gm., and the cavity packed with gauze to control the bleeding, which was considerable. No perineal opening was made. Convalescence was rather slow, after the first shock of the operation, on account of the formation of a dense tumor to the right of the bladder, evidently a pelvic exudate. The mass was aspirated through an incision, but with a negative result. Urine was voided through the urethra on June 10, and the patient was discharged, emptying his bladder and passing all urine by the natural channel, on August 17. He is now well, and when I last examined him there was no residual urine. He gets up once at night, and passes water every four hours during the day.

Case VII.—J. H. C. was referred to me on June 23, 1901, becaus-

of impediment to urination and severe bleeding from the urethra on attempted catheterization. He was 56 years old, and, with the exception of a gonorrhea in his youth, had been in robust health until three years before, when an attack of retention had been relieved by the use of the catheter. For two years he had remained apparently well except for some frequency in micturition. Then another attack of retention occurred, and the catheter had to be once more resorted to. After that the attacks became more and more frequent, and about three months before he came to me there was severe bleeding after the use of the instrument. Following this, any attempt at catheterization or other manipulation about the urethra occasioned hemorrhage, which was described by the patient as extremely severe. Some residual urine was invariably present after he had voided all he could. I found the general condition very good, excepting that the loss of blood had resulted in a fairly marked anemia. With the greatest gentleness I attempted to pass a woven olive-tipped catheter, but on reaching the compressor urethræ a hemorrhage began which was the most alarming in my experience. A steady, fast stream of arterial blood came from the meatus, as if from a wound in a large vessel, and I was glad to be able to check the flow by compression of the urethra. The prostate by rectum felt large and hard.

The patient was advised to enter the hospital, so that an operation through the perineum might be performed for the purpose of checking the tendency to hemorrhage. He was admitted as a private patient on June 25, and the following day the operation was undertaken. The curved von Dittel incision, as for the evacuation of a prostatic abscess, was made, and the deep urethra thoroughly exposed. On opening the canal a severe hemorrhage at once occurred, and it became evident that there was a false passage directly into the bulb. This region was packed, and, the bleeding having ceased, the urethral incision was continued backward into the prostatic portion, it being my intention to explore the bladder with the finger. The prostate was, however, so large, and the urethra was so much lengthened by the hypertrophy, that my finger would not reach the vesical cavity. Suprapubic section was made, and the prostate enucleated with little difficulty in three large fibrous lobes weighing together 126 gm. Drainage by tubes in the perineum and in the suprapubic wound completed the operation. Within the following twenty-four hours there was considerable bleeding, so that the bladder and perineal wounds had to be packed again. A bronchopneumonia with delirium made me very uneasy for several days, but by the middle of the second week convalescence was safely established. A suppurative epididymitis developed on the sixteenth day, and an incision was necessary a few days afterward. By the twenty-fourth day all the urine was voided through the normal channel, the suprapubic vesical opening having closed. One month after operation the patient was discharged, a granulating wound of the scrotum still present, but otherwise well. The urine was not yet perfectly clear, but there was perfect function as to micturition,

not a drop of residual urine remaining. He is at present in excellent health, and his urine is normal.

Each one of the last five cases was reported on by Dr. F. S. Mandlebaum, Pathologist to Mount Sinai Hospital. Every specimen was cut, stained, and microscopically examined. The report states that in all there were evidences of an increase in all the elements of the prostate, gland, fibrous tissue, and muscle, forming the usual "hypertrophy" of the prostate. No pure adenomatous or fibromatous masses were found.

I have ventured to bring before you this evening these patients and histories, in order to demonstrate the value of the suprapubic vesical incision in removal of the prostate—a procedure which, for reasons unknown to me, has not attained the popularity which I feel it deserves. In speaking with my colleagues I find that it is the exception to meet one who has had experience with it. Then, too, while I am willing to admit that this particular operation for the relief of the disease may not fit all cases equally well, I wish to argue that, as a general rule, with few exceptions, the first step in the operative cure of any form of prostatic obstruction should be a suprapubic cystotomy, even if it should later become evident that the disease itself must be attacked from another quarter. It is the only way in which we can gain absolute certainty as to the condition of the bladder. Those who favor the perineal route may be successful in selected cases, but there must always be an element of doubt, unless the interior of the bladder can be thoroughly seen or palpated. Naturally, it can never be properly examined by vision through the perineal opening, and often, especially in the presence of great enlargement of the prostate, the finger is not long enough to reach the vesical opening. The cystoscope, valuable as it is, has its limitations, and in any event cannot be compared in point of accuracy with direct observation through a wound in the bladder. In the presence of active hemorrhage the instrument is far from one of precision, and in certain forms of prostatic obstruction it cannot be introduced at all. Thus, ulcerations, neoplasms, diverticula, sacculations, incrustations, and even stones, especially those occupying pouches, may be overlooked, to the detriment of accurate prognosis and good surgery. Galvanocaustic prostatotomy is, undoubtedly, an important means of relief, and is eminently suitable in many cases; but it must be admitted that, unless this operation is preceded by suprapubic section, one must take the risk that serious

intravesical trouble exists which may nullify the expected benefit. Besides, the cystotomy gives us the additional advantage of drainage in complicated cystitis. I have in mind a case of carcinoma of the prostate in which cystoscopy was impossible because of hemorrhage, and in which the diagnosis of probable prostatic hypertrophy had been made. Suprapubic operation was undertaken for purposes of exploration as well as treatment, and the tumor thoroughly curetted. The result was cessation of hemorrhage and great amelioration of the symptoms, the respite lasting for several months. The suprapubic wound healed quickly. This might not have been thought a fit case for galvanocautery, in any event, but the perineal operation might have been considered with the probability that the bleeding would not have been checked, and that the wound, being in cancerous tissue, would never have closed.

In dealing with chronic obstruction at the neck of the bladder, the primary step, then, should be suprapubic section. After this, according to the condition of the bladder and the character of the obstruction, the operation may proceed. If the case is one of prostatic "hypertrophy," the second step should be selected according to the condition of the patient and the character of the obstructing mass. Small nodules obstructing the internal urethral orifice may be removed either through the incision already made or through an additional opening in the perineum, which may be left for drainage. Moderately large masses which can probably be enucleated may be removed either from above or below, according to anatomical conditions, and the superior wound will then be found of great value, because it permits an assistant to press directly upon the gland, forcing it within easier access from below. If the patient is very old or feeble, or if he takes the anesthetic badly, the operation of enucleation from above will usually be found much speedier than the perineal dissection. Should a very large prostate be encountered, it is not probable that it can be enucleated from below.

If the prostate is very soft and hyperemic, or if it is of such a texture that it cannot be enucleated, one has the choice of galvanocauterization through the urethra (Bottini), through the perineal wound, or of removal with the cutting forceps by conjoined manipulation.[7] In any case the suprapubic wound will be of great service. Its disadvantages I believe to be greatly exaggerated. The operation of opening the bladder from above is quick, simple, and in my experience accompanied by little shock. The mere cystotomy is far less bloody than

the usual perineal section. When speed is the all-important element, as it frequently is in old persons, it must be remembered that the cystotomy takes only a few moments. The entire operation with removal of the prostate is finished in from fifteen minutes to half an hour.

The steps of the operation as I have performed it are briefly as follows: Washing out the bladder, the catheter being left in the emptied viscus. Incision of the tissues through the linea alba. Retraction of the recti. Inflation of the bladder with air, using an ordinary atomizer bulb fixed to the catheter. Palpation of the parts through the wound, so as to judge of the size and shape of the bladder, as well as the degree of inflation. Pushing up the peritoneal reflection. Opening the bladder between two retracting sutures. Exploration of the viscus with the finger, then by the eye, raising the pelvis if necessary. Snipping the mucous membrane covering the most prominent portion of the prostate. Enucleation of the gland with two fingers of the left hand, while an assistant with finger in the rectum supports the parts. A perineal opening may or may not be made, according to the exigencies of the case. I am of the opinion that, when a capable nurse is to be in charge, the bladder and the laceration in its floor can be perfectly drained with the continuous siphon apparatus without the opening from below. If perineal drainage is decided upon, however, it is easy to cut down upon the beak of a sound placed within the space left by the removed prostate, and pushed against the tissues, so that it presents in the perineum.

In two of my operations I placed sutures of chromic catgut at either side of the drainage tube, inverting the bladder wall after the manner suggested by Gibson[7]; but in all of my cases time seemed an important element, and anything which tended to lengthen the operation was avoided.

All patients should be prepared by free purgation and diuresis. The latter is most important, and I attribute the fatal termination in Case II. very largely to the fact that this precaution could not be thoroughly carried out. The administration of urotropin and copious draughts of water seems to be perhaps the best way in which this can be accomplished, the urotropin acting as a urinary antiseptic as well. It is my habit to continue the administration of the water until within two hours of the time set for operation.

The principles of the scientific treatment of chronic prostatic obstruction are being steadily evolved. As with all diseases, so here,

each individual case must be treated according to its needs, and the skill of the surgeon is not so much required in the carrying out of his plan as in its proper and careful selection and elaboration. My argument for suprapubic section is advanced with the hope of aiding the cause of thoroughness and accuracy.

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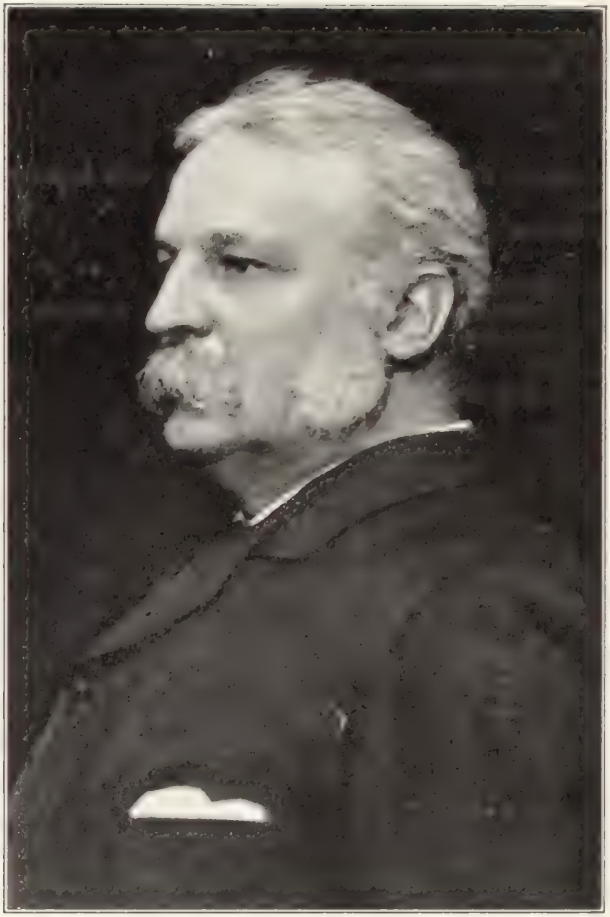

Paul F. Mundé.

IN MEMORIAM.

PAUL F. MUNDÉ, M.D.

Dr. Paul F. Mundé was associated with the Mount Sinai Hospital for twenty-four years. In 1878 he was appointed Gynecologist to the Dispensary, and on the resignation of Dr. Emil Noeggerath in 1882 he was assigned to the charge of the hospital wards with the title of Attending Gynecologist. This position he filled with conspicuous fidelity and with growing fame to himself and to the hospital until his death on February 7, 1902.

His surgical work was marked by the impress of his early training with the Prussian army in the Franco-Prussian War, with the master Scanzoni, and with the teachings of Sims and the older Emmet. By his energy and by the broad view which he brought to his work, he created a gynecological service in the Mount Sinai Hospital which has become known among scientific men everywhere. Through his contact and intimate acquaintance with the men prominent in his specialty and with the literature of his subject, he succeeded in constantly bringing his work abreast with modern gynecological art and frequently going beyond it.

To him was largely due the popularization of Alexander's operation in this country, and he was among the first to recognize the value of, and to practise, Tait's flap-splitting operation for complete perineal laceration. His operative technics were simple but efficient, and during the performance of an operation he took particular pains and pleasure that those about might understand what he was doing. His clinics, always largely attended, became interesting for this reason and for the clear exposition which he always gave of the pathological conditions involved.

In plastic work he found his most congenial work, and it is doubtful if any gynecological surgeon could surpass him in these operations. The Tait operation, Stoltz's operation for cystocele and Hegar's for rectocele, Emmet's operation for lacerated cervix, were

his favorite procedures and seemed easy of performance in his hands. For the relief of sterility in an anteflexed and stenosed uterus, discission and dilatation, with or without curetting, was his operative measure of choice. He preferred abdominal to vaginal hysterectomy and in his later years abandoned the stump operation altogether.

The bulk of his literary work was done during his connection with the hospital. His "Minor Surgical Gynecology," which saw several editions, was the result of his clinical experience there; and when Thomas desired a revised edition of his work to appear, he chose Dr. Mundé as the man of broadest experience and of ripest judgment to perform the task for him. His occasional articles, too, were inspired mainly by his public and private work at Mount Sinai, and some of his most widely known contributions to medical literature were inspired by cases seen there. In his paper, "Twenty-five Years of Gynecology at the Mount Sinai Hospital," the methods and results of his service are set forth.

Perhaps the greatest service he rendered the gynecological world was by his strong conservatism—this, too, at a time when the *furor operandi* was heralded as a sign of progress, and when it required moral courage of a high degree to oppose the dicta of men high in the profession. Dr. Mundé lived long enough to see his opinions vindicated and to be able to feel that his influence had been cast in the right direction, and that it was not the least element that made for a change in professional opinion.

As an example of the perfect gentleman, of a man of untiring industry, who bore the most genuinely cordial and affectionate relations to his house staff and to his colleagues on the Medical Board, whose tender consideration for the poorest as for the wealthiest patient made him widely beloved, whose standing enhanced that of the hospital, Dr. Paul F. Mundé will always live in the memory of those associated with him at Mount Sinai Hospital.

GYNECOLOGICAL SERVICE.
1900—1901.

PAUL F. MUNDÉ, M.D.,
ATTENDING GYNECOLOGIST.

JOSEPH BRETTAUER, M.D., AND HIRAM N. VINEBERG, M.D.,
ADJUNCT GYNECOLOGISTS.

ON account of illness at the end of the year 1901, Dr. Mundé was unable to make a report of his year's work or to select any part of it for publication in this Report. As we were not on duty from November 1 to May 1, and therefore were not acquainted with the most interesting cases which occurred during that period, it is with regret that we are unable to report any cases treated during that time.

Dr. Brettauer was in charge of the service from May 1 to June 15 and again from September 1 to November 1. In the interval Dr. Vineberg was in charge.

The following tables are modelled upon the same plan as that followed by Dr. Mundé in previous Reports.

SYNOPSIS OF DISEASES (632).

Vulva (3 cases).

Epithelioma	1
Cyst of vulvovaginal gland	1
Kraurosis	1

Urethra and Bladder (14 cases).

Caruncle	2
Vesicovaginal fistula	1
Vesicoabdominal fistula	1
Urethrovaginal fistula	1
Ureterovaginal fistula	1
Urethral stricture	1
Gonorrheal urethritis	2
Cyst of urethra	1
Retention of urine	1
Chronic cystitis	3

Perineum (25 cases).

Laceration	25

Vagina (56 cases).

Cystocele	22
Rectocele	27
Atresia	1
Cystic tumor of floor of vagina	2
Senile vaginitis	2
Burn of cervix, vagina, and vulva	1
Enterovaginal fistula; general peritonitis	1

Rectum (7 cases).

Hemorrhoids	4
Fistula in ano	1
Rectovaginal fistula	2

Uterus.

CERVIX (77 cases).

Lacerated cervix	63
Stenosis	11
Hypertrophy	1
Carcinoma	2

Body (242 cases).

Endometritis	112
Retroversion and retroflexion	39
Retroflexion and pregnancy	1
Prolapse	10
Fibroids	24
Retained secundines and incomplete abortion	24
Anteflexion and stenosis (sterility)	7
Polyp	8
Carcinoma	4
Sarcoma	1
Subinvolution	2
Lactation atrophy	2
Inversion with adherent necrotic placenta	1
Dysmenorrhea	1
Double uterus and vagina with pregnancy	1
Hydatidiform degeneration of the chorion	1
Hydramnion	1
Pyometra	1
Parametritis	1

Ovaries (62 cases).

Tumor	33
Dermoids	2
Abscess and salpingitis	23
Prolapse	3
Double ovarian tumor and pregnancy	1

Tubes (56 cases).

Pyosalpinx	12
Chronic salpingitis	29
Ectopic pregnancy	14
Tubercular salpingitis	1

Pelvic Peritoneum and Cellular Tissue (44 cases).

Pelvic peritonitis	26
" abscess	11
" hematoma	6
" exudate with laceration of uterus	1

Miscellaneous (50 cases).

Cholelithiasis	4
Cholecystitis	1
Pericholecystitis and appendicitis	5
Carcinoma of liver	1
Chronic catarrhal appendicitis	5
Pyonephrosis	2
Pyelonephritis	1
Movable kidney	1
Postpartum sepsis	1
Pelvic phlebitis	1
Tubercular peritonitis	3
Eclampsia	1
Dystocia from adhesions of uterus to abdominal wall; rupture of abdominal wall	1
Strangulated femoral hernia	1
Inguinal hernia	1
Tumor of omentum	3
Femoral phlebitis	3
Burn of thigh	1
Acute intestinal obstruction	1
Puerperal psychosis with catalepsy	1
General peritonitis	3
Hysteria	1
Not gynecological	8

Synopsis of Operations (510).

Vulva (4 operations).

Excision for kraurosis	1
" of vulvovaginal cyst	1
" " tumor	2

Urethra and Bladder (7 operations).

Excision of urethral cyst	1
Dilatation of urethra	1
Excision of caruncle	2
Plastic for vesicovaginal fistula	1
" " rectovaginal fistula	1
Catheterization under anesthesia	1

Perineum (27 operations).

Perineorrhaphy	27

Vagina (50 operations).

Anterior colporrhaphy	22
Posterior colporrhaphy	27
Excision of cyst of vaginal floor	1

Rectum (4 operations).

Hemorrhoids	4

Uterus (300 operations).

Cervix (85 operations).

Trachelorrhaphy	44
Amputation	20
Discission and dilatation	7
Dudley's plastic	13
Exploratory section	1

Body (215 operations).

Curetting	165
Alexander's	19

Vaginal fixation for retroversion and cystocele	2	Hysterectomy for carcinoma	2
Incision for pyometra	1	Hysterectomy, vaginal, for other causes	10
Hysterectomy, abdominal, for fibroids	5	Vaginal fixation of round ligament for retroversion	4
Hysterectomy, abdominal, for sepsis	2	Laparotomy and myomotomy	1
Hysterectomy, vaginal, for sepsis	1	" for ventral fixation.	2
		Morcellement of fibroid	1

Ovaries and Tubes (59 operations).

Laparotomy for ovarian tumor and abscess	40
" " parovarian cyst	1
" " ectopic gestation	6
Vaginal section for ovarian cyst	1
" " " salpingo-oöphoritis	5
" " " ectopic and pelvic hematoma	6

Miscellaneous (64 operations).

Laparotomy for tubercular peritonitis	2
" " general peritonitis	1
Exploratory laparotomy	5
Laparotomy for cholecystotomy	3
" " appendicectomy	9
" " secondary hemorrhage	1
Enterotomy for intestinal paresis	2
Suture of ruptured abdominal wall	2
Vaginal section for pelvic abscess	18
Incision of pelvic abscess	8
Accouchement forcé for dystocia	1
Anesthesia for examination	2
" " dressing	1
Suture for hemorrhage (cervical)	4
Bassini for inguinal hernia and shortening of one round ligament	1
Radical cure of femoral hernia	1
Skin graft	2
Nephrectomy	1

Causes of Death.

Diseased appendages; peritonitis	1
Double salpingo-oöphoritis; pelvic peritonitis (operated)	1
Carcinoma of ovaries; cachexia	1
Sarcoma of ovaries (operated); pelvic peritonitis	1
Pyosalpinx; septic metritis	1
Ectopic gestation (operated); bronchopneumonia	1
Pyometra (operated); general peritonitis	1
Fibroids and torsion of uterus (operated); peritonitis	1
Pelvic exudate and abscess	1
" abscess; general peritonitis	1
Post-abortive pelvic peritonitis	1
" general peritonitis	1
Puerperal sepsis	2
" " hysterectomy	1
" " septic pneumonia	1
" eclampsia	1
Rectovaginal fistula; pneumonia; sepsis	1
Pelvic hematocele; ulcerative carcinoma of intestines; perforation; general peritonitis	1
Intestinal obstruction	1
	20

Case I. *Secondary Hemorrhage due to Slipping of Ligature Following Post-vaginal Section for the Removal of Ovarian Cyst; Recovery.*—E. B., 20 years of age, married, nullipara, was admitted on May 23 for prolapse of enlarged left ovary. After curettement a posterior section was made on May 29. The enlarged ovary was easily brought down, the pedicle found and tied with ordinary catgut of medium size. The peritoneal opening was narrowed by a suture at either angle, and a strip of gauze left for drainage. The patient was removed to the ward and nothing unusual was noticed. About two hours and a half after the operation it was reported that she was bleeding slightly from the vagina and that there was a gradually failing pulse. The patient was immediately brought back to the operating room and showed all signs of acute anemia. It was therefore decided, in view of the nature of the operation, to waste no time in searching for the source of hemorrhage from below. Abdominal incision revealed the pelvic cavity full of blood from the actively bleeding left ovarian artery, the ligature having become loosened. In a few minutes the pedicle was tied and the abdominal cavity flushed with hot saline solution, and the incision closed with through-and-through sutures. The patient rallied well within a few hours and improved steadily until her discharge on June 20.

The interesting features of this case are that it is the only case in which I have used catgut for a ligature and the only case in which a pedicle ligature has slipped. The reason I used catgut was because at the time we were employing for general surgical purposes a catgut which I had been led to believe was absolutely reliable, and the opportunity for its use was convenient. In view of my experience with catgut for pedicle ligatures, I took special care to tie the ligature accurately. It probably slipped on account of the diminished tension after replacement of the broad ligament in the pelvic cavity. Fortunately the consequences of this accident were not fatal.

Case II. *Myomectomy During Early Pregnancy, with Subsequent Normal Delivery.*—E. U., 35 years of age, mother of one child 8 years of age, was admitted on June 18. She had menstruated regularly until April 6, and again on April 21 lasting until April 27. She was under treatment for several months for abdominal pain which was ascribed to a freely movable right kidney. For some time she had noticed a mass in the right iliac region. It gave rise to no discomfort until the cessation of her menses; after that it increased materially.

On examination the uterus was found to be slightly enlarged, soft, contracting under the examining finger. The abdominal mass, the size of a child's head, was freely movable. A pedicle arising from the right horn of the uterus could be distinctly made out. A diagnosis of

probable pregnancy with fibroid was made and the patient was operated upon on June 19.

The fibroid was removed, the pedicle excised and its edges sewed together with silk. Convalescence was uninterrupted and rapid. At no time were there any signs of uterine contractions or hemorrhage. The patient was discharged in July and on February 2, 1902, passed through a normal confinement.

The interesting feature in this case was the absence of any bad effect of the operation on the already existing pregnancy.

Case III. *Suppurating Intraligamentous Ovarian Cyst; Hysterectomy; Recovery.*—J. G., 25 years of age, married ten years, mother of one child 2½ years old. About eight months ago, after a delay of from one to two weeks, she suffered from metrorrhagia, for which she was curetted. Several weeks previous to admission she suffered from pain in the lower part of the abdomen, and also noticed a swelling in the left side which gradually increased in size.

Examination showed a mass, the size of a child's head, in the left side of the abdomen; it was rather tense, pseudo-fluctuating, and slightly movable. Bimanual examination revealed the uterus directly behind this mass and apparently not closely connected with it.

The patient was operated upon by Dr. Mundé on March 5. A cystic mass was found occupying the entire left lower half of the abdomen; it was intraligamentous and its peritoneal covering was slightly adherent to the omentum. On inserting a trocar the contents were found to be thick pus. In attempting to enucleate the mass the sac was torn in several places and a large quantity of pus escaped over the field of operation and into the abdominal cavity. Hysterectomy was done, the right ovary being left. The pelvis was drained through the vagina with iodoform gauze. Through-and-through sutures united the abdominal incision. A few days after the operation a large mass was noticed to the left of the incision; this proved to be an abscess in the abdominal wall. After drainage of this abscess was instituted, recovery was uninterrupted, and the patient was discharged on April 21.

Dr. Mundé, having tried to enucleate the intraligamentous cyst for some time, was compelled to leave the operating room and requested Dr. Brettauer, who was present by accident, to take his place. By this time two hours had been consumed, and the condition of the patient was such that further attempts at enucleation would have unduly prolonged the operation; hysterectomy was therefore done as being the quickest way of finishing the operation. The opposite broad ligament was tied, the uterus amputated, and the mass, together with the uterus, easily removed.

In the absence of a bacteriological examination it is to be assumed that the contents of the cyst were sterile, as convalescence was comparatively uneventful. It is more than likely that the patient had a simple ovarian cyst at the time she was curetted for incomplete abortion and that infection occurred at that time.

CASE IV. *Incomplete Abortion; Suspected Tubal Pregnancy; Ovarian Cyst.* L. W., 21 years of age, married eight months, was admitted October 22. Menstruation regular, last on July 11. Felt perfectly well until October 1, when she was seized with a sudden severe cramp in the lower part of the abdomen, accompanied by slight bleeding. These symptoms abated soon, only to return a week later with renewed severity. At this time the patient recalled the discharge of a membranous mass accompanied by profuse flow.

On examination the uterus was found corresponding in size to a six-weeks pregnancy, soft, and with a patulous os. There was slight bleeding. To the right and partly behind the freely movable uterus a tender mass the size of an orange could be felt, apparently independent of the uterus.

The patient was narcotized, the uterus curetted, and a large quantity of débris and a two-months fetus were removed. The uterus was packed. A posterior vaginal incision was then made and an ovarian cyst was removed. The peritoneal opening was drained. Recovery was prompt.

The interesting feature in this case was the differential diagnosis between intrauterine pregnancy accompanied by ovarian cyst and extrauterine pregnancy. Of course, while a positive diagnosis was impossible before curettement, the real condition was immediately demonstrated after the uterus had been cleaned out. At the time I assumed that the case was clean and did the posterior section for the removal of the ovarian cyst, with the idea that, taking into consideration the physical signs, tubal gestation could not be positively excluded. As a routine practice I would undoubtedly prefer, in similar cases, to postpone removal of the tumor until a later date.

CASE V. *Papilloma; Recurrence Two Years after Removal of Apparently Benign Ovarian Cyst.*—F. W., 49 years of age, eight children, three abortions, admitted June 17. Menstruation at 14, always regular, profuse; last nine months ago; last pregnancy nine years ago. On September 25, 1899, she was operated upon by Dr. Brettauer by abdominal section for the removal of a large multilocular cyst of the right ovary, which was followed by an uneventful recovery. The specimen presented the typical characteristics of colloid cyst with

innumerable partitions. There were no vegetations of a papillomatous character to be seen, and therefore, unfortunately, a microscopical examination was not made. The left ovary was left *in situ*, being normal, although rather atrophic. The patient was well for eighteen months after the operation. She then noticed a slight induration in the scar of the abdominal wound, but paid but little attention to it. On June 17, 1901, she again presented herself, and I found in the lower part of the abdomen a distinctly circumscribed tumor which occupied the entire length of the scar and appeared to be closely adherent to it, being movable only with the abdominal parietes and giving the impression that it was an extraperitoneal growth originating in the abdominal fat.

On June 18 an elliptical incision was made around the scar, and it was then found that the interior surface of the scar was so intimately connected with the rectus muscle, its sheath, and the peritoneum, that it was deemed advisable to open the abdomen above the scar and exsect the mass with its adherent abdominal wall. The posterior portion of the tumor had apparently no peritoneal covering, but was covered with omentum, which was easily tied off. By removing about half an inch of fascia on either side, removal of the growth was easily accomplished. The uterus and left ovary were atrophic. The peritoneum was closed with catgut after through-and-through button sutures had been placed, and, although the tension was considerable, the edges of the wound were brought together. Recovery was interrupted only by three stitch-hole abscesses, and the patient was discharged on July 28.[1]

While it is not rare to see recurrences after abdominal section for the removal of papillomatous cysts of the ovary, or of any other organ within the abdomen by simple enucleation, the development of a secondary growth after removal of an apparently benign cyst is in my experience a unique occurrence. However, as neither a histological nor microscopical examination of the original specimen was made, the possibility exists that in part of the tumor there was a tendency to proliferation which gave rise to the secondary growth in the abdominal wall.

Report of Pathologist (Dr. Mandlebaum).—The tumor is oblong in shape and of the size of a child's head. The surface is smooth for the most part, excepting at its upper half, where it is intimately connected by scar tissue to the old wound. The consistence of the tumor is rather soft and of a semi-fluctuating nature. On section a large number of cysts are seen, varying in size from that of a small hen's

[1]February 1, 1903: The patient has been perfectly well since the second operation.

egg to that of a pea. Some of these are filled with a dark-brownish colored fluid, others with a friable, reddish-colored tissue, and others contain a homogeneous colloid-like material. Between these various cysts the tumor tissue is dense and gristly in character.

Sections made from various parts of the tumor show a rather complex structure. A large part of the growth is composed of dense fibrous tissue containing small, well-defined, circular areas of myxomatous tissue. Extending into the fibrous tissue from all sides are irregular areas of large round and spindle-celled sarcomatous tissue containing giant cells of massive size. The giant cells are for the most part round in shape, though many are seen of a somewhat elongated shape. Their nuclei are regularly distributed throughout the entire cell, or else crowded toward the centre, leaving an even margin at the periphery, and are very rich in chromatin. In many of the sarcomatous areas evidences of old and recent hemorrhages are noted, with the presence of blood pigment, varying in color from a golden yellow to a dark reddish brown. Similar pigment is also seen in the fibrous areas, but in a much less amount. In some situations enormous hemorrhages of recent date are seen. These areas are quite circular in shape and the blood cells are easily distinguished and fairly normal in appearance. Scattered throughout the blood cells are numerous tumor cells which have been dislodged from their previous attachments. Many of the larger areas of hemorrhage are seen to be situated in pre-existing cysts, the walls of which are lined by a distinct layer of endothelial cells. Some of these cysts contain no blood, but are filled with a poorly-staining granular material. Blood vessels are present in only small numbers. Some show a chronic obliterating endarteritis and others appear quite normal. Surrounding some of the smaller arteries are areas of acute inflammation with the presence of small lymphoid cells.

Diagnosis: Giant-celled fibro-myxo-cysto-sarcoma (round and spindle-celled), with hemorrhages and pigmentation.

Case VI. *Post-puerperal Psychosis: Katatonia.*—C. B., 20 years of age, admitted September 10. The patient had been confined one month previously; labor normal, with the exception of a somewhat profuse hemorrhage during the third stage. Five days after delivery a scarlet-colored, pin-point rash appeared over the entire body. The patient was somewhat feverish and extremely thirsty and restless. On the thirteenth day the symptoms had increased and a diagnosis of blood-poisoning was made. On the fourteenth day the patient's mind suddenly became blank; she did not speak or recognize any of her family. This condition persisted with the exception of a few short intervals. At times it was necessary to use force to restrain the patient in bed, as she had made several attempts to jump out of the window. For ten days previous to admission the temperature had been normal. The uterine discharge had been profuse and foul,

as ascertained from a physician who had had charge of the patient. Urination was involuntary, but there was constipation, defecation not having occurred for five days before admission.

On examination the abdominal and pelvic organs were found to be normal. Temperature 99° F., pulse 80. There was marked cutaneous anesthesia. The corneal and pharyngeal reflexes were diminished; the knee jerks were exaggerated. Electrical reaction was normal.

Mental Condition.—At all times the patient lay in bed flat on her back, and even when not asleep was absolutely motionless. If spoken to she would look intently at the person speaking, but would not answer any questions addressed to her. The facial expression was blank and showed no emotion whatever, no worry, no fear. Her silence was not due apparently to any delusion or to any voice commanding her not to speak. She offered no resistance to passive movements. Her limbs, especially her upper extremities, remained in any position in which they were placed. After a few minutes they would drop into their natural position.

For a number of weeks the condition remained unchanged; then she began to answer simple questions, to tell her name, age, etc., and by degrees to express her wishes, asking for water, food, etc., and began to take notice of what was going on around her in the ward.

Hysterical mutism and melancholia with stupor could be excluded. The condition corresponded most closely to that of katatonia pure and simple. There is no reason to suppose that this peculiar mental state was the result of a septic process. This and similar conditions are known to occur after acute infectious or any other exhausting disease.

The patient was discharged cured on November 7.

By Hiram N. Vineberg, M.D.,
ADJUNCT GYNECOLOGIST.

I. *Ruptured Extrauterine Pregnancy; Large Hematoma within Left Broad Ligament; Very Free Hemorrhage at Operation, necessitating Hysterectomy (Abdominal); Ureteral Fistula Twelve Days post Operationem; Returned to Hospital September, 1901, with Right Pyonephrosis; Nephrectomy by Dr. J. Brettauer; Recovery.*—Mrs. L. R., 38 years of age; married fifteen years; 5 children, last child seven months ago; no miscarriages. The last menstrual period set in at the regular time, but continued off and on for fourteen days. There was a cessation of the uterine bleeding for two days, when she was suddenly seized with severe pain in the abdomen which was attended with fainting spells. There was now a recurrence of the uterine bleeding, slight in amount. I saw her in my dispensary service a few days later and found a large, irregular, boggy mass filling the left half of the pelvic cavity. The mass was not sensitive and seemed fixed, and was some distance from the vaginal wall. The uterus was found slightly enlarged. A diagnosis of ruptured tubal pregnancy was made and the patient was admitted into the hospital for operation. On opening the abdomen (June 19, 1901) I found the sigmoid flexure extensively adherent to the mass on the left side. After separating the adherent intestine I began enucleating the blood tumor and the embedded tube and ovary. After the mass was enucleated there was such profuse hemorrhage from various points, but more especially from the side and posterior aspects of the uterus and the torn broad ligament, that I decided upon ablation of the uterus, which was speedily done, and the hemorrhage was controlled. The patient made a good recovery, but eleven days after the operation there was a leakage of urine through the vaginal opening, and on investigation it was found that there was an ureteral fistula. After she was up and about the patient was cystoscoped several times to determine which ureter was the injured one, but at no time was it possible to ascertain this definitely. The ureteral catheter would readily enter either ureter and become arrested at about an inch from the bladder. The patient left the hospital August 7 in good health, but with the persistence of the ureteral fistula.

She was readmitted into the hospital September 17, 1901, with symptoms of pyonephrosis of the right kidney. On October 2 Dr. J. Brettauer performed lumbar nephrectomy on the right side, the removed kidney showing a large collection of pus in the pelvis. The patient passed through a rather stormy convalescence, but finally made a good recovery and was discharged December 20 in very good condition.

The points of interest in the case are:

(1) The occurrence of ectopic gestation without any delay in the

menstrual period, the only irregularity noted being its persistence for a longer period than usual (fourteen days). As a rule, in ectopic gestation the patient will have passed her period for one or more days, and the flow generally is irregular, ceasing for a time and then recurring. This case, however, constitutes the third I have seen in which there was entire absence of any irregularity in the date of appearance of the menses.

(2) The occurrence of such profuse hemorrhage as to necessitate for its control the extirpation of the uterus. Cases of uncontrollable hemorrhage in ectopic gestation calling for hysterectomy have been occasionally recorded by various operators, but this was the first in my experience. In the light of subsequent events I have asked myself the question whether it would not have been better to have attempted a cure of the patient by vaginal incision and drainage. The blood tumor, however, was not very accessible through the vagina, having developed within the upper portion of the broad ligament; and it is more than probable, had such an attempt been made, that it would have met with failure. It is only when the accumulation of blood forms a hematocele in Douglas' cul-de-sac or at the base of either broad ligament that such a procedure is indicated.

(3) The occurrence of the ureteral fistula so late as twelve days after the operation, and the existence of the injury in the right ureter when one would expect, from the location of the blood tumor (in the left ligament), that the left ureter would be the one likely to be injured.

The development of the pyonephrosis was doubtless due to the stenosis of the injured ureter and ascending infection. Owing to the apparent stenosis of both ureters and the impossibility of definitely locating which was the seat of the fistula, an attempt at cure of the condition was not feasible prior to the onset of the pyonephrosis.

Ureteral fistula following hysterectomy, be it vaginal or abdominal, unfortunately is not a very rare occurrence, no matter who the operator may be. It occurs more frequently than one would be led to suppose from the cases recorded in the literature. Occasionally an operator is found who is courageous enough to publish his cases in full, and whose skill, anatomical knowledge, and extensive experience cannot be called into question. Such a report appears in *American Medicine* (November 1, 1902), by Dr. John A. Sampson, embodying the cases in the service of Howard A. Kelly at Johns Hopkins Hospital from August 17, 1889, until August 17, 1902: "There have been 32

instances of injuries to the ureter occurring during an operation. The ureter has been ligated or clamped 16 times. Nineteen of these 32 injuries have occurred in hysterectomy and carcinoma of the cervix of the uterus, of which we have had 139." In order to avoid injury to the uterus, it has been Dr. Kelly's custom for the past twelve years to catheterize the ureter in hysterectomy for carcinoma of the cervix. "Of 32 cases of surgical injuries to the ureter, 19 have occurred in hysterectomy for carcinoma of the cervix. In 11 of these the ureters have been catheterized. This seems a poor showing for catheterization of the ureters, but it must be remembered that the catheters not only made the operation itself easier, but also the detection of the injury, whether by ligation or incision."

Of the tabulated cases of injury to the ureter embodied in the quoted article, one case occurred in hysterectomy for adherent tubes and ovaries and pelvic peritonitis, and one case in hysterectomy for left dermoid cyst and adherent right tube and ovary.

When the fistula occurs several days after the operation (as in my case, on the twelfth day), it is due either to sloughing of the ureteral wall by extension from the adjacent tissues, or to some interference with the blood supply to the ureter by stripping off peritoneum in enucleating the diseased structures.

Wertheim,[1] in his radical operation for carcinoma of the cervix, purposely exposes the pelvic portion of the ureter. In 60 of his cases uretero-vaginal fistulas formed in 5 cases (two of which were double), evidently due to interference with the blood supply of the organ.

II. *Dystocia due to Accidental Adhesion of the Uterus to the Abdominal Wall Subsequent to Laparotomy for Ectopic Gestation; Breaking up of the Adhesions; Bringing Down the Cervix and Delivery by Accouchement Forcé per Vias Naturales.*—The patient, 28 years of age, married and mother of two children, had been operated upon at Beth Israel Hospital twelve months before for ectopic gestation. A small gauze drain at the lower angle of the wound had been employed. The resulting fistula was some time in closing; otherwise the patient made a good recovery and became pregnant within the uterus about three months later. The pregnancy apparently progressed normally, and when seen by me July 3, 1901, it had just entered the eighth month. The woman had then been in severe labor pains for three days without making any progress. She was beginning to suffer from exhaustion. On examination of the abdomen I found a long, wide scar, and at its lower third was a circular opening

[1]Archiv für Gynäkologie, 1901, Bd. xlv., Heft 1, S. 1.

about the size of a ten-cent piece. A thin, transparent membrane resembling peritoneum stretched across the bottom of the opening, through which the uterus could be seen. The uterus projected considerably over the symphysis and could not be pushed upward to its natural position. On vaginal examination the cervix was crowded backward and upward toward the promontory and was beyond the reach of the index and middle fingers. On palpating the anterior vaginal fornix a thick wall of tissue could be made out extending above the symphysis and corresponding to the condition described as found in dystocia following ventral fixation of the uterus.

The patient was at once transported to Mount Sinai Hospital, where, after hasty preparations, she was anesthetized and an attempt made with the hand in the vagina to seize and bring down the cervix, an assistant at the same time pushing the fundus forcibly upward. This was not successful at first and it seemed as if Cesarean section would have to be resorted to. But on inspecting the abdomen I found that in scrubbing it the thin membrane stretching across the circular opening above described had been torn away and that a portion of omentum protruded through it. Under proper aseptic precautions this was replaced, and, introducing my index finger through the opening, I swept it across the lower part of the abdomen as far as I could, breaking up several adhesions between the uterus and abdominal wall. I now repeated my attempt to bring down the cervix, at the same time pushing on the fundus with the other hand, and after some time succeeded in doing so. I then dilated the cervix manually, and delivered, by version, a male fetus corresponding to about the eighth month of development. The abdominal fistula was freshened and packed with iodoform gauze. The patient made a good recovery, though the fistula was rather slow in healing. She left the hospital July 24, three weeks from the date of her admission. The baby at this time was not thriving very well, having an attack of enterocolitis; but it improved satisfactorily after the patient left the hospital.

One of the noteworthy features of the case is the accidental adhesion of the uterus subsequent to a laparotomy, proving such an obstacle to the progress of labor as might have necessitated serious surgical intervention. Had it not been for the presence of the circular defect in the abdominal scar, admitting the index finger with which the adhesions between the uterus and abdominal wall were broken up, the necessity for a laparotomy would have arisen. Further interest lies in the case in the fresh illustration it presents that no matter how an adhesion between the uterus and ventral wall is brought about, dystocia may result; and all the talk about avoiding the possibility of dystocia in ventral suspension by passing the sutures on the anterior and posterior surface of the fundus, and only through

the parietal peritoneum and not through the muscle or fascia, is rudely shattered by such a case as the foregoing and other cases in the literature. In my opinion the course pursued in the case is also of value in affording a suggestion as to treatment of cases of dystocia subsequent to ventral fixation or suspension in which the same conditions obtain *i.e.*, fundus prevented from rising through adhesions to the abdominal wall, and in consequence the cervix being pushed up to the promontory or beyond it. If, with the patient under anesthesia, the cervix cannot be grasped with the fingers of one hand while the other hand makes forcible pressure upon the fundus upward, would it not be wise, before resorting to Cesarean section, to make an attempt to break up the adhesions between the uterus and abdominal wall after the abdomen has been opened?

III. *Partial Inversion of Puerperal Uterus with Adherent Putrid Placental Tissue; General Sepsis; Vaginal Hysterectomy; Recovery.*—Mrs. M. Z., aged 38 years, the mother of eight children, had been delivered about four weeks prior to her admission to the hospital on July 18, 1901. Her physician informed me that he had diagnosticated placenta previa, but apart from this the delivery had been normal. A few days later she began to have fever and chills, with fetid lochia. For this she was given several vaginal antiseptic douches daily by his assistant. Her condition apparently improved for a time, but the high fever soon returned and the patient was evidently losing ground. The assistant found later that it was difficult to insert the douche point, as there appeared to be something in the vagina which was obstructing it. The lochia now became more fetid, and sloughing pieces of membranous tissue were passed. One of these pieces was given to a pathologist for microscopic examination, but he could make nothing of it, as it was in such an advanced state of decomposition.

On her admission I was notified at once that a case of puerperal sepsis had been admitted to the service. I responded as quickly as possible. I found that every one who had come near the patient was in a condition bordering on demoralization, for the odor from her was indescribably sickening and repulsive. The patient, for this reason, was not sent to the ward, but to the anesthesia room awaiting my arrival. When I entered the room I came nigh succumbing to the terrible odor myself, as some of the others had. In my whole experience I had never encountered an odor so peculiarly fetid, overpowering, and nauseating. The patient had a strongly septic appearance, was very anemic, had a small rapid pulse (130) and a temperature of 104°. She was immediately anesthetized and taken into the operating room, where I first made a vaginal examination. I found the vagina filled by a globular mass about the size of a double closed fist. The surface of the mass was covered here and there with

black, stringy membranous-like tissue. I could find nothing resembling a cervix, but on bimanual examination I felt a body above the mass which I took to be the uterus. I was very much puzzled with the condition, and at first thought I had to do with a sloughing fibroid or a malignant growth (deciduoma malignum). There was no other course open but an attempt at removal of the mass, in which I was very much handicapped by lack of assistance, as the house surgeon properly had given leave of absence to most of the staff, and also to the spare operating room nurse, on account of the disgusting odor. I began cautiously to remove the mass piecemeal, being careful to avoid hemorrhage by the free use of clamps. While I was proceeding with this, one of the house staff, Dr. Robert T. Frank, suggested that it might be an inverted uterus, and before I went much further I became of the same opinion. But the tissues were so disorganized and the landmarks so altered that it was not until I had cut away most of the vaginal mass and entered the peritoneum, that I was enabled to see the relation and contour of the fundus to the mass, and then I was certain of the correctness of that view. Of course the intestines were walled off with gauze compresses as soon as the peritoneal cavity was entered. The remainder of the operation was fairly easy. After the clamped vessels were ligated, the vagina was thoroughly cleansed, the gauze compresses removed, and a strip of iodoform gauze employed to pack the intestines away from the vaginal incision. The patient made an excellent recovery. The highest temperature, 101.4°, was reached on the third day. She was discharged as cured August 3, sixteen days after operation. It was some weeks, however, before the marked anemia disappeared.

The case was of special interest to me, first, on account of the insidious occurrence of the inversion, and, secondly, on the intimate organization of the placental tissue with the uterine wall. It was impossible to find any line of cleavage with the fingers, or to distinguish with the naked eye any differentiation. The inversion no doubt occurred as follows: There had probably been a deep tear of the cervix. As a result of this and of the adherent placental tissue, the cervix gradually began to roll outward, and, this process continuing, the uterine wall followed the cervix until at least three-fourths of the uterus was involved in the inversion. The upper fourth of the uterus, being in a fairly normal condition, underwent a certain degree of involution, and was thus prevented from taking part in the inversion.

To the free drainage which the local condition permitted, and to the frequent washing away of the débris with antiseptic douches, must be attributed the fact that the patient did not succumb to the sepsis for so comparatively long a time as four weeks. Every one, however, who saw her when she entered the hospital was strongly

convinced that she could not have held out much longer. It was also a surprise to many of them that any operative intervention could have saved her. The case furnished an instructive object lesson in the question of hysterectomy for puerperal sepsis of uterine origin.

IV. *Tuberculous Peritonitis and Salpingitis Simulating Ectopic Gestation; Laparotomy; Salpingo-oophorectomy Dextra; Salpingectomy Sinistra; Recovery.* Mrs. R. C., aged 22 years, was admitted into the hospital August 6, 1901, and gave the following history: She was married four years; had one miscarriage shortly after marriage, and gave birth to a child at full term fifteen months ago. Her menses set in at the thirteenth year, were of the four-weekly type, moderate in amount, and not attended with pain. Her previous history was negative. She had enjoyed good health until her present illness, which set in suddenly about two weeks ago. At that time she had been without menstruating for six weeks, or, in other words, had skipped her period two weeks. She was then suddenly seized with "colicky" pains in the lower part of the abdomen and began to spot. The slight uterine bleeding continued off and on until her admission. Ever since the onset of her illness she has been compelled to keep to her bed on account of the pain and general malaise.

Her condition on admission was as follows: Medium sized, well nourished; mucous membranes of good color; tongue coated with white fur; temperature 103°, pulse 110. The lower part of the abdomen gave a decided resistance and was tender, especially on the right side. On bimanual examination the whole pelvis posteriorly was filled with irregular masses of varying consistence, some being moderately fluctuating, others being quite hard. These masses were merged into another mass which extended up on the right side to a couple of inches above Poupart's ligament. The uterus was indistinctly felt in a forward position and could not very well be differentiated from the pelvic masses. A diagnosis of ectopic gestation was made, though I stated that inflammatory adnexa could not be excluded.

On opening the abdomen the peritoneal covering of the intestines was found thickly studded with tubercles, and several coils of intestines were found adherent to the pelvic organs. After separating the intestinal adhesions, numerous cystic collections were found in the pelvis, which were punctured and evacuated. Both adnexa were very much thickened and very extensively adherent to the floor and sides of the pelvis. The right tube and ovary were removed *en masse*. The appendix was found adherent to them and was also ablated. While the operation was in progress, Dr. E. Libman, the Assistant Pathologist to the hospital, obtained some smears from the contents of both tubes and by a rapid process of examination found tubercle bacilli in the contents of both. The left ovary appeared fairly normal, though very ragged from the remains of the broken-up adhesions. It was not removed. There was a moderate-sized abscess situated

below the left tube, which was entered into and its walls enucleated together with the tube. The pus was carefully mopped up. The raw and irregular surface at the bottom of the pelvis was lightly packed with iodoform gauze, one end of which emerged at the lower angle of the abdominal wound. The patient made a slow but satisfactory recovery. For several months afterward the left ovary on repeated examinations was found to be of about normal size, but at the expiration of about nine months the patient began to suffer with pain in the left iliac region. At this time the ovary was found to be the size of a mandarin orange and seemed cystic. After that the patient was lost sight of and her subsequent history is unknown to me. [The patient came to my dispensary service recently (August, 1903). She was in excellent general health; and on vaginal examination only a slight enlargement of the left ovary was detected. Otherwise the pelvis was free from any abnormal conditions.]

The points of interest in the case are:

(1) The sudden onset in apparent good health.

(2) The absence of menstruation for a period of six weeks, then a scanty, irregular flow accompanied by "colicky" pains—the classical symptoms of ectopic pregnancy. The local findings seemed to corroborate this diagnosis—a pelvis full of irregular masses of varied consistence such as would be produced by intraperitoneal hemorrhage at different periods. The extreme youth of the patient evoked in me the strong desire to conserve some of her pelvic organs, and hence I left the uterus and the left ovary. During the time the patient was under observation there were no signs of any return of the tuberculous condition. The development of the cystic condition of the left ovary after the lapse of nine months was doubtless of a simple inflammatory nature and was dependent in a measure upon the traumatism necessary to enucleate it from its bed of firm adhesions.

Another point of interest in the case was the general healthy appearance of the patient. Apart from the usual objective symptoms accompanying an acute affection of the pelvic organs, there was nothing in the patient's appearance to indicate such an extensive tuberculous process. The process doubtless was of longer duration than was indicated by the symptoms, which dated back only a couple of weeks. It was a forcible illustration of how insidiously tuberculous disease of the pelvic organs may develop and advance.

GYNECOLOGICAL SERVICE.

DECEMBER 1, 1901, TO DECEMBER 1, 1902.

JOSEPH BRETTAUER, M.D.,
GYNECOLOGIST.

HIRAM N. VINEBERG, M.D.,
ADJUNCT GYNECOLOGIST.

I ASSUMED charge of the gynecological service at the time of Dr. Mundé's illness and have been in charge since then, with the exception of the summer months when Dr. Vineberg was on duty.

On account of the uncertainty as to the removal of the hospital to its new buildings, but few changes have been made in the conduct of the service. The main improvement has been in the assigning of a junior assistant to the service for three months uninterruptedly. The history books formerly in use have been replaced by blanks to conform with those in use in the other departments of the hospital.

Some of the operations formerly practised as routine measures have been changed. Dudley's operation for anteflexion and stenosis has taken the place of discission and dilatation, and Stoltz's operation for cystocele has given way to a more radical measure. In older women, at or near the climacteric, I have in many cases employed a method which I have described elsewhere,[1] the main feature of which is the use of the forcibly displaced uterus as a truss for the bladder, to prevent a recurrence of the cystocele which is the main objection to all operations previously practised. The final results of this operation I will embody in a subsequent report. All operations, even of a minor character, are now performed in the operating room, the examining room being used exclusively for the examination and after-treatment of patients. For large, solid exudates in the pelvis I have in a few cases employed the compression treatment by mercury, with

[1] N. Y. Medical Journal, 1901.

varying result, in the main favorable. In general the treatment, operative and otherwise, has been entirely in accord with the conservative lines always followed by my predecessor.

The following tables differ from the ones heretofore published in the manner in which the operations are counted. When a combination of operations has been performed on one patient, the main procedure has been given the number, the minor ones not being counted.

JOSEPH BRETTAUER, M.D.

GYNECOLOGICAL SERVICE.

December 1, 1901, to December 1, 1902.

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ADJUNCT GYNECOLOGIST.

Patients admitted	445
Diseases treated	545
Diseases cured	443
" improved	38
" unimproved and not treated	42
Died	22
Number of operations	478

SYNOPSIS OF DISEASES AND RESULTS.

	Not operated.	Cured.	Improved.	Unimproved.	Died.	Total.
Vulva (8 cases).						
Kraurosis	..	2	..	..	..	2
Ulcers	1	2	..	..	..	2
Vulvitis	2	1	..	1	..	2
Vaginal cyst	..	1	..	..	..	1
Carcinoma of vulva (secondary to inguinal glands)	..	..	1	..	..	1
Urethra and Bladder (9 cases).						
Caruncle	1	1	..	1	..	2
Chronic cystitis	2	1	2	..	..	3
Periurethral adhesions	1	1	..	..	..	1
Calculus	..	1	..	..	..	1
Varicose veins of bladder	..	..	1	..	..	1
Irritable bladder	1	..	..	1	..	1
Vagina (83 cases).						
Cystocele	4	38	..	4	..	42
Rectocele	4	32	..	4	..	36
Rectovaginal fistula	1	..	..	1	..	1
Ureterovaginal "	..	1	..	..	..	1
Impacted pessary	..	1	..	..	..	1
Atresia vaginæ	1	1	1	..	..	2
Perineum (18 cases).						
Laceration, complete	..	3	..	..	..	3
" incomplete..	1	14	1	..	..	15
Rectum (2 cases).						
Hemorrhoids	..	1	..	..	..	1
Ischiorectal abscess	..	1	..	..	..	1

	Not operated.	Cured.	Improved.	Unimproved.	Died.	Total.
Uterus (269 cases).						
CERVIX (44 cases).						
Lacerated cervix	1	19	1	1	..	26
Stenosis	..	5	..	..	..	5
Carcinoma	1	3	2	1	..	6
Polypus	..	1	..	..	..	1
Cicatricial stenosis and deformity	1	..	1	..	..	1
Hypertrophied cervix	..	5	..	..	..	5
BODY (226 cases).						
Chronic endometritis	3	57	4	3	..	64
Retroversion and retroflexion	1	28	..	1	..	29
Anteflexion and stenosis	2	21	1	1	..	23
Prolapsus	..	2	..	..	..	2
Fibroids	5	20	..	5	5	30
Retained secundines (incomplete abortion)	..	3	..	..	..	3
Post-abortive endometritis	..	39	1	..	..	40
Pregnancy	2	12	1	1	..	14
Polypus	..	3	..	..	..	3
Carcinoma	1	1	1	..	..	2
Multilocular cyst	..	1	..	..	..	1
Labor	..	1	..	..	..	1
Post-abortive pelvic peritonitis	1	..	..	..	1	1
Post-puerperal sepsis	3	3	..	..	1	4
Metritis	..	1	..	..	..	1
Parametritis	4	3	1	..	..	4
Inversion and prolapse	1	..	..	1	..	1
Laceration of uterus; sepsis	..	..	..	..	1	1
Aneurism of uterine artery	..	..	..	..	1	1
Ovaries (32 cases).						
Cyst	..	15	..	..	..	15
Dermoid	..	3	..	..	..	3
Intraligamentous cyst	..	2	..	..	..	2
Abscess	..	6	..	..	..	6
Carcinoma	1	2	..	1	..	3
Inflammation	1	1	..	..	..	1
Prolapse	1	..	..	1	..	1
Abscess and peritonitis	1	..	..	..	1	1
Tubes (49 cases).						
Pyosalpinx	..	2	..	..	..	2
Hydrosalpinx	..	2	..	..	..	2
Chronic salpingitis	..	1	..	..	..	1
Ectopic gestation	..	17	..	..	1	18
Diseased appendages	3	11	5	5	..	21
Tuberculous salpingitis	..	2	..	..	..	2
" " and uterus	..	..	..	..	1	1
Pyosalpinx and sepsis	..	..	..	..	2	2

	Not operated	Cured	Improved	Unimproved	Died	Total
Peritoneum and Cellular Tissue (51 cases).						
Hematoma	1	4	1	..	..	5
Abscess	2	23	2	2	..	27
Parovarian cyst	..	1	..	..	..	1
Hematocele and peritonitis	..	..	..	..	1	1
Tumor	1	..	..	1	..	1
Exudate	3	6	5	1	..	12
Postpartum pelvic abscess; pyopneumothorax	..	..	..	..	1	1
Pelvic peritonitis	..	1	..	..	..	1
Peritonitis, tubercular	2	..	..	1	1	2
Miscellaneous (24 cases).						
Appendicitis	..	5	..	..	2	7
Sarcoma of abdominal wall and bladder	..	..	1	..	..	1
Sinus of abdominal wall	..	1	..	..	..	1
Fibromyoma of abdominal wall	..	1	..	..	..	1
Syphilis	1	..	..	1	..	1
Femoral hernia	..	1	..	..	..	1
Hyperemesis; pregnancy; nephritis	..	1	1	..	..	2
Tubercular kidney	..	1	..	..	..	1
Ascites	1	..	..	1	..	1
Ulcerative endocarditis; streptococcemia	1	..	..	..	1	1
Neurasthenia	1	..	..	1	..	1
Carcinoma of breast	..	2	..	..	..	2
" " ascending colon	..	..	..	..	1	1
Intestinal obstruction due to bands	..	..	..	..	1	1
Chronic myositis of abdominal wall; chronic inflammation of intestinal wall; pelvic exudate	..	..	1	..	..	1
Chronic myositis of rectus muscle	..	1	..	..	..	1

Synopsis of Operations.

Vulva (4 operations).

Plastic for kraurosis	2
Excision of vaginal cyst	1
" " ulcer	1

Urethra and Bladder (7 operations).

Excision and cauterization of caruncle	1
Cystoscopy	3
Suprapubic cystotomy	2
Cauterization of varicose veins in bladder (through urethra)	1

Perineum (17 operations).

Laceration, complete (flap-splitting—Tait)	3
" incomplete	14

Vagina (73 operations).

Anterior colporrhaphy	38
Posterior "	32
Removal of impacted pessary	1
Hymenectomy	1
Ureterovaginal fistula	1

Rectum (2 operations).

Clamp and cautery for hemorrhoids	1
Incision and drainage of ischiorectal abscess	1

Uterus (240 operations).

Cervix (31 operations).

Trachelorrhaphy for laceration	20
Discission and dilatation for stenosis	5
Amputation for hypertrophy	5
Excision of cervical polyp	1

Body (209 operations).

Curetting, for endometritis, menorrhagia, and retained secundines	101
Shortening of round ligaments (Alexander's)	15
Abdominal hysterectomy for fibroids	11
Vaginal hysterectomy for fibroids	8
Morcellement for uterine fibroids	2
Enucleation of submucous fibroid	1
Abdominal hysterectomy for tuberculosis of uterus and appendages	1
Vaginal hysterectomy for cancer	1
Abdominal " " "	3
Myomectomy for fibroids	3
Induction of premature labor	12
Dudley's operation for anteflexion	21
Reposition for retroflexed uterus	1
Vaginal fixation	9
Ventral "	12
Cauterization of cancerous cervix	2
Vagino-utero-fixation	1
Atmokausis	1
Abdominal hysterectomy for polycystic uterus	1
Removal of polyp	3

Ovaries and Tubes—Pelvic Peritoneum and Cellular Tissue (107 operations).

Abdominal Section for:	
Ovarian tumor	2
" cyst	17
Parovarian cyst	2
Tubo-ovarian abscess	1
Diseased appendages	13
Hydrosalpinx	2
Hematocele	1
Pelvic cellulitis	2
Tuberculosis of ovary (hysterectomy)	1
Ectopic gestation	17
Ovarian abscess	4
Vaginal Section for:	
Pelvic abscess	23
Ovarian cyst	3
Ectopic gestation	1
Salpingo-oöphoritis	1
Pelvic hematoma	4
Ovarian abscess	1
Revision of pelvic abscess	3
Pelvic exudate	9

Miscellaneous (20 operations).

Exploratory laparotomy for inoperable carcinoma	1
Incision and drainage of inguinal abscess	1
Extirpation of aneurismal sac of uterine artery	1
" " tumor of abdominal wall	1
" " sinus after an appendicectomy	1
" " carcinomatous inguinal glands	1
Nephrectomy for tubercular pyonephritis	1
Radical operation of femoral hernia	1
Appendicectomy	7
Amputation of breast	2
Exploratory laparotomy for inoperable tumor of intestine	1
Ileosigmoidostomy	1
Skin graft	1

SPECIAL CASES.

CASE I. *Carcinoma of Cervix and Posterior Vaginal Wall; Abdominal Hysterectomy (Wertheim's Method).*—J. H., aged 36, no children, two miscarriages. Always menstruated regularly until four months before admission; since this time irregular bleeding and foul-smelling discharge. Pain in left iliac region, radiating down left leg.

Admitted September 8. On admission the patient's general condition was good. The cervix presented a large, irregular, ulcerated mass which bled easily on touch. The left fornix of the vagina was indurated and partly ulcerated. The uterus was large, reaching to three finger breadths above the symphysis, apparently movable. A small fibroid was found in the anterior uterine wall. The right appendages were about the size of a lemon, closely adherent to the uterus. No urinary or rectal symptoms were complained of, nor was there any evident glandular enlargement.

On September 17 the patient was anesthetized and the uterus found to be movable; there was no apparent involvement of the parametria. The ulcerated part of the cervix and vagina was thoroughly curetted with a sharp spoon and cauterized. Abdominal hysterectomy was then performed by Wertheim's method, which I had had the opportunity to study and witness shortly before. On account of the tightly adherent appendages on both sides and extensive adhesions between the intestines and uterus, the preliminary step of dissecting both ureters down to the point where they cross the uterine arteries was rather difficult and tedious. The rest of the operation was performed in a typical way, and the uterus with half of the vagina was removed. No glands were found. The recovery was uninterrupted.[1] She was discharged October 29.

I report this case because I have always been extremely pessimistic as to our ability to render any material aid to such cases when the

[1]February 1, 1903: The patient was examined on this day and was found entirely well.

disease has once passed the uterus. In this case the disease had already invaded the vagina to a considerable degree, and only a short time ago I would have pronounced the case inoperable; while now I have learned that even if I cannot cure such cases permanently, I can at least, by means of this operation, make life endurable. I was led to perform the operation from a study of the results of Wertheim's operations, and shall in the future employ abdominal hysterectomy exclusively for all cases of carcinoma of the uterus, body or cervix.

Case II. *Fibrocyst of Uterus.*—I. S., 34 years of age, single; admitted October 29. Menstruation regular and painful, normal in amount. Last period two weeks previous to admission. For about three years the abdomen had gradually increased in size. There has been discomfort only when the patient attempted to lie on the left side, until two months ago, when the size of the abdomen rapidly increased and caused difficulty in respiration.

On examination the abdomen was found to be distended to about the size of a full-term pregnancy, with dulness over the entire anterior surface, both sides giving a tympanitic sound. Distinct fluctuation was present over the abdomen. Bimanually a small cervix was to be felt high up in the pelvis, no fundus uteri being appreciable. The diagnosis of an ovarian cyst, most likely malignant in character, was made. (Fig. 1, page 452.)

Abdominal section was performed October 30. The cystic tumor, filling the entire abdominal cavity and extending to half the distance between the umbilicus and the ensiform cartilage, was punctured. A thick, yellowish, sticky fluid was evacuated and the mass gradually but easily brought forward, after several other cystic compartments had been emptied. It was now clear that the mass originated in the fundus of the uterus and that on either side, about half an inch below it, normal appendages were attached to the uterus. A typical supravaginal amputation was done. The patient made an absolutely uninterrupted recovery and was discharged November 20.

The pathologist of the hospital, Dr. Mandlebaum, reports that the specimen shows the following: The uterus is present, excepting its vaginal portion. Both the tubes and ovaries, as well as the round ligaments, are normal in every way. The uterine cavity is two inches long and contains a small mucous polyp. The endometrium appears normal otherwise. From the fundus of the uterus on both sides large fibroid masses arise, giving the impression for the moment of a bicorned uterus. These masses where they join the uterus are firm and hard. Small hemorrhages are seen upon the cut section. From the periphery of these tumors multilocular cysts arise. Some of the smaller ones contain sebaceous-like material, the larger ones clear

greenish-yellow fluid. The cyst walls are in some places very thin, in other places very dense and thick.

Uterine cavity with polypus.

FIG. 1.

CASE III. *Ruptured Early Interstitial Pregnancy.*—R. W., admitted January 11, with a typical history of a ruptured ectopic gestation and presenting the classical appearance of a woman suffering from shock and hemorrhage. The abdomen was distended and

the percussion note in the flanks was dull. There was general abdominal tenderness. The cervix was wide open and the uterus was enlarged. There was a slight flow. The pouch of Douglas was bulging and boggy. After vigorous stimulation narcosis was attempted, but was immediately discontinued on account of syncope. A median abdominal incision was quickly made by the house surgeon, Dr. E. Beer. A very large quantity of fluid and coagulated blood was removed. Both tubes were inspected, but no sign of rupture or of abortion was detected, and no cause for the hemorrhage was apparent until the uterus was brought forward. A tear, about half an inch in length, in the left horn was then disclosed. This tear was partly in the tube and in part in the uterine wall. The tube was amputated and the ruptured area in the uterus excised and sutured. The abdomen was hurriedly closed. Intravenous saline infusion was resorted to during and after the operation, to which can be ascribed the patient's gradual recovery. She was discharged February 8.

The striking features in this case lie in the severe and almost fatal hemorrhage, the comparative rarity of interstitial pregnancy, and the recovery of the patient from the grave condition in which she was removed from the operating room. The recovery was the more remarkable as the patient was subjected not only to the shock of rupture, but to the additional shock of the operation unmitigated by an anesthetic.

Case IV. *Myomectomy During Pregnancy.*—Mrs. W., 32 years of age. Menstruated regularly and profusely. Last menstruation June 15. Admitted December 4. For several weeks previous to admission the patient complained of severe pain in the region of the symphysis, with a constant desire to urinate. On examination the uterus was found to correspond in size to a six-months pregnancy. The cervix lay high in the pelvis, and anterior to it a mass of the size of the fist was felt which extended from above the symphysis pubis into the anterior fornix. Attempts to dislodge this mass caused considerable distress and were futile. The bladder was pushed downward and to the left by the tumor. According to the observation of the family physician, the growth had rapidly increased in size during the last few weeks.

It was clear that the tumor was a pedunculated fibroid; and, since it could not be dislodged from its position, it was equally evident that it would act as a serious cause of dystocia when labor should begin. While the growth was situated low enough in the uterus to permit of its removal by anterior vaginal section, the abdominal route was chosen for the double reason of causing less traction upon the uterus and of more easily controlling any possible hemorrhage.

Abdominal section was performed on December 5. The mass was easily removed and its pedicle was sutured. Several smaller, subserous nodules were also shelled out, but one larger interstitial fibroid, situated somewhat higher up in the anterior wall of the uterus, was not interfered with. Recovery was uneventful, and at no time were there any uterine contractions or uterine hemorrhage. The patient was discharged cured on December 28, and was subsequently delivered on March 11, 1902, after a short and normal labor.

Case V. *Aneurism of Uterine Artery.* Mrs. N., 32 years of age, was admitted on March 15. The previous history of this patient was published in detail[1] in the Mount Sinai Hospital Reports for 1898 by Dr. Mundé. About six years ago a pelvic abscess had been opened by vagina, which was followed by severe hemorrhage, easily controlled, however, by packing. In 1898 Dr. Mundé found a "softly elastic, strongly pulsating and thrilling tumor, of about the size of a hen's egg, projecting into the left vaginal vault close to the cervix and extending slightly down on the left vaginal wall. It was evidently an enlargement of the uterine artery." On October 15, 1898, the left internal iliac artery was tied with chromicized catgut, whereupon the controlling assistant could feel the cessation of pulsation. Recovery was uninterrupted. Immediately after the operation, however, there was a faint, apparently transmitted pulsation in the aneurism, which at the end of a week had increased somewhat. To effect a shrinkage of the aneurism several galvanopunctures were made and currents of twenty milampères were passed through it. Six weeks after the operation the aneurism had shrunken to one-half of its original size, was hard and painless, and pulsated no more than the normal uterine artery.

For three years after this operation the patient felt well. The backache and dull pain in the left side of the pelvis returned and gradually increased, until two months previous to readmission she complained of the same throbbing sensation as before. Vaginally a distinctly pulsating and thrilling tumor was felt as described above. She entered the hospital on March 15 and was operated upon on March 16.

After a median incision it was found that the entire small pelvis was occupied by adherent intestines, the left appendages being tightly matted together with a coil of intestine. The adhesions were broken up, the intestines replaced into the abdominal cavity, and the uterus was then brought into the wound with the patient in the extreme Trendelenburg position. It was at once evident that the aneurism could not be exsected without the preliminary removal of the uterus. Pressure on the left iliac artery, over both ovarian arteries, and over the right uterine artery had no effect in stopping the pulsation of the aneurism. The two ovarian arteries and the right uterine artery

[1]Mount Sinai Hospital Reports, vol. i., p. 266.

were then tied and the entire uterus removed (Fig. 2), except a small piece of cervix and uterine wall adjacent to the aneurism. The next step consisted in ligating the left internal iliac artery with silk, upon which the aneurism ceased its pulsation at once and what arterial hemorrhage had been taking place stopped also. The aneurism was deeply embedded in a mass of cicatricial tissue, the remains of the former parametritis, and was but a mere shell surrounded by parametritic scars. Nevertheless, with arduous labor and patient dissection, the entire aneurism, with half an inch of the internal iliac artery, was finally removed, and with these about half an inch of the left ureter which crossed the artery and was so firmly embedded in

FIG. 2.

the aneurismal wall and in the cicatricial tissue that it could not be separated from them. There was a great deal of venous hemorrhage, which was controlled by clamps. The ureteral anastomosis was easily accomplished by the invagination of the central end into the peripheral by means of two sutures which were guided through the bladder into the urethra. The anastomosis was further enforced by a row of circular sutures. The pelvis was packed with gauze, which was carried in part into the vagina and in part through the lower angle of the abdominal incision. The entire operation lasted over three hours, and yet the patient left the table in fair condition.

Forty-eight hours after the operation signs of septic infection appeared, and the patient died a week after the operation, despite all efforts to save her, of septic peritonitis, which was verified by an autopsy through the wound. The ureteral anastomosis was found to be perfect.

The fatal outcome of the case can be attributed to the great length of the operation and its subsequent profound shock, and, further, to the fact that the assistants were changed several times during the operation, which probably accounts for some break in the asepsis.

This is but the second case recorded in gynecological literature of an aneurism of the uterine artery, the first being the case of Mars.[1] The present case having been reported in detail by Dr. Mundé two years ago (*loc. cit.*), it should be known in literature as his case.

CASE VI. *Intestinal Obstruction Due to Fibrous Band During Pregnancy.* L. H., aged 31 years, admitted to the hospital October 22 with the following history, which was kindly given by the family physician: Three years previous to admission the patient had given birth to a healthy child and suffered after that from pelvic inflammation with abscess formation. After several months of illness she recovered and had complained only of obstinate constipation. Her present illness dates back five days, when her physician was called for nausea and abdominal pain. The patient being in the seventh month of pregnancy, the symptoms were ascribed to that condition and morphine was administered, followed by relief only for a time. Forty-eight hours after onset violent vomiting again set in and the patient began to bleed profusely from the vagina. The pain became localized in the lower part of the abdomen. On vaginal examination the cervix was found open and the placenta was felt laterally implanted. A diagnosis of placenta previa was made. The abdomen was said to be relaxed, the only tumor palpable being the pregnant uterus. Accordingly an *accouchement forcé* was practised, an internal version was done, and the child extracted. After the operation an extensive laceration of the cervix was noticed. Later, on the same day, the patient vomited a great deal of bile-colored fluid and again began to bleed from the vagina, which was packed and the hemorrhage thus controlled. On the third day the pulse ranged between 104 and 120; the vomiting continued; the abdomen was lax, but there was marked tenderness in the hypogastrium. On the fourth day the pulse became more rapid, irregular, and weaker; the temperature was 103° F.; the abdomen became distended; pain and vomiting continued; the bowels did not respond to enemata and had not moved since the illness began. The patient now complained of pain at the right border of the ribs, but there was nothing palpable in this region. On the fifth day there was no change, except that a small, tender mass the size of an orange, dull on percussion, could be felt in the right hypochondrium. In view of the fact that the laceration of the cervix was high up, and with a mass on the right side, the condition of rupture of the uterus with hematoma in the broad liga-

[1]Mars, Wiener med. Woch., No. 37, 1891.

ment was at first suspected by me when I saw the patient in consultation. During the day this mass became larger.

During the evening of the fifth day, October 22, the patient was admitted to the hospital and immediately anesthetized. A vaginal examination disclosed a right lateral laceration of the cervix. The latter was soft and friable. The torn edges and the substance of the cervix were gangrenous; the posterior vaginal vault was extensively lacerated; the layers of the broad ligament were separated and contained foul-smelling serum and blood. The uterus was soft and not well contracted. On the right side of the abdomen a mass was felt, the size of a cocoanut, elastic, easily palpable and movable. Aspiration yielded a foul-smelling, bloody fluid. Through a transverse lumbar incision the mass was found to be intraperitoneal. The peritoneum was opened and the mass delivered. A complete obstruction of a loop of small intestine was found, the obstructing element being a very firm fibrous band; the included loop of intestine was completely gangrenous and distended with the same foul-smelling fluid which was previously aspirated. The gangrenous loop was resected and the afferent and efferent loops of intestine were sewn into the wound. The patient went into collapse two hours after the operation and died.

SYNOPSIS OF FATAL CASES.

Case I. *Fibroids of Uterus; Diabetes.*—A. M., 45 years old, died December 31, 1901. Patient came to the hospital with a foul vaginal discharge due to necrotic fibroids; her urine contained from four to six per cent. of sugar. She was not operated upon, but died in diabetic coma five days after admission.

Case II. *Fibroids of Uterus; Umbilical Hernia; General Fibrinopurulent Peritonitis.*—E. S., 34 years old, died January 4, 1902. Patient came to the hospital complaining of prolonged, profuse menstruation. Examination revealed a large fibroid uterus, for which a hysterectomy was done on December 31, 1901. On account of the marked adiposity and an adherent intraligamentous cyst which burst, the operation was rendered difficult, requiring two hours, throughout which the patient's condition was good. The raw surface left by the removal of the cyst required drainage through the vagina. On the second day after operation she developed all the symptoms of a general peritonitis, of which she died on the fourth day after operation. A wound examination showed a general peritonitis with a small amount of sanguineous seropurulent fluid.

Case III. *Infected Hematocele; Sepsis.*—R. B., 27 years old, died January 19, 1902. For three weeks before admission on January 15,

patient complained of pains in the lower part of the abdomen, with continual bleeding from the vagina, some fever and chilly sensations. Examination revealed an hematocele, for which an anterior vaginal section was done on January 18. In attempting to strip back the bladder it was denuded of its muscular coat, and the mucous membrane prolapsed and presented in the wound. The hematocele was opened and irrigated, foul-smelling, old blood clots and fresh blood coming away. The cavity was then packed with gauze. The patient reacted poorly. Her abdomen became distended, temperature 103.8° F., and signs of a secondary internal hemorrhage made further intervention seem necessary in spite of the septic condition. On January 19 a laparotomy was performed. The hematocele cavity was again emptied of its clots, and all bleeding stopped; it was well walled off, excepting at one point where a loop of intestine and a small section of already gangrenous omentum protruded. This was resected and a Mikulicz packing inserted. The patient required vigorous stimulation on the table, never rallied, dying six hours after the second operation.

Case IV. *Tubercular Peritonitis; Exhaustion.*—E. H., 36 years old, died January 22, 1902. Patient entered the hospital in October, 1901, giving a history of tubercular peritonitis, substantiated by physical signs. On November 6 an exploratory laparotomy was performed by Dr. Mundé. Omentum and intestine were found adherent to the abdominal wall, and all the intestines well matted together; very little free fluid was present. Several adhesions were broken up in order to examine the tubes and ovaries. The patient developed a fecal fistula, ascites became marked, and she gradually failed, dying two and a half months later.

Case V. *Fibroids of Uterus; Myocarditis.*—R. K., 52 years old, died January 31, 1902. Abdominal hysterectomy was performed on January 30. Before the operation the patient showed signs of myocarditis. Soon after operation her pulse became rapid, weak, and irregular, and did not respond to stimulation. Temperature normal. She died twelve hours after operation.

Case VI. *Abortion; Pelvic Peritonitis.* A. S., 24 years old, died February 19, 1902. Four days before admission the patient aborted and was curetted on the same day. Two days later she was again curetted. She was suffering from severe abdominal pain, chills, fever, and vomiting. On admission to the hospital on February 18 she was practically moribund and beyond the possibility of any surgical intervention.

Case VII. *Uterine Fibroid; Apoplexy (Post-operative).*—M. L., 46 years old, died February 21, 1902. Patient was admitted to the

hospital on February 18, when an abdominal hysterectomy for fibroids was performed. The patient reacted well after operation, except for a somewhat irregular pulse. On February 21, at 11:40 P.M., she suddenly had a clonic spasm of the right side of the body, respiration became stertorous, pulse imperceptible, and she died within ten minutes.

CASE VIII. *Postpartum Streptococcemia (Non-traumatic).*—F. G., 26 years old, died March 5, 1902. Two weeks previous to admission the patient was normally delivered of a full-term child. Since delivery had had chills and fever. Admitted to the hospital on February 28. Examination revealed an enlarged soft uterus with a wide-open cervix. Patient ran a continuous high temperature, became unconscious on the second day after admission, and died three days later. Blood culture revealed streptococci.

CASE IX. *Uterine Fibroids; Diseased Appendages; Post-operative Sepsis.*—C. B., 40 years old, died May 1, 1902. Patient entered the hospital on April 25 and had an abdominal hysterectomy performed on April 28. At this time a catgut was being tried in the hospital which was prepared in a new way. Two days after operation the entire abdominal wound was found to be broken down and suppurating. The patient died of sepsis on May 1.

CASE X. *Aneurism of Uterine Artery.*—See Case V. of Special Cases, page 454.

CASE XI. *Double Pyosalpinx; Post-operative Sepsis.*—J. F., 29 years old, died May 16, 1902. Patient was admitted to the hospital on May 11 with a diagnosis of diseased appendages. She was operated upon for the latter on May 14 by median laparotomy. The diseased tubes on the left side were adherent to the sigmoid and the rectum. In trying to shell out the mass a rent in the peritoneum was made in the sigmoid flexure about two inches long; this was sewed with fine catgut and the appendages were removed. The tube on the right side was found adherent to the cecum and was excised in the same way. Soon after operation the patient developed symptoms of sepsis and died two days later. The postmortem examination showed no general peritonitis; the posterior surface of the uterus was covered with slightly adherent intestines. The coil which was denuded of peritoneum during operation and was covered with mesocolon was found permeable, but slightly strictured, no leakage from the intestine having been possible. The spleen and liver were soft.

CASE XII. *Ruptured Ectopic Gestation; Post-operative Shock.*—H. L., 36 years old, died June 2, 1902. Patient entered the hospital

on May 30 with an indefinite history of pain in the right iliac fossa; no vaginal bleeding, no other symptoms. Examination revealed a wide-open, soft cervix. On June 2, at 5 P.M., she was curetted and sent back to the ward. Half an hour later she suddenly developed all the symptoms of shock and internal hemorrhage. Since there was no hemorrhage, a laparotomy was done and a ruptured tubal pregnancy was found on the right side, with considerable blood in the abdominal cavity. Although the patient was vigorously stimulated and received several infusions, she died half an hour after the second operation.

This patient was curetted by the house surgeon before an examination had been made by me. Most probably rupture occurred during the performance of the curettage.

CASE XIII. *Pyosalpinx and Peritonitis (Post-operative).*—R. K., 30 years old, died June 25, 1902. Patient was operated upon for pyosalpinx on June 17. During the operation the tube burst and the pus was carefully mopped up. Since the peritoneal cavity was well walled off by packings, no drain was inserted and the abdominal wound was closed. A week later the patient died of peritoneal sepsis.

CASE XIV. *Abscess of Broad Ligament and Pyopneumothorax.*—B. L., 30 years old, died June 30, 1902. On entering the hospital, May 9, the patient gave a history of chills and fever and abdominal pain, following childbirth. Examination revealed a mass on the right side of the cervix and pus coming from the cervix. On May 17 a pelvic abscess was evacuated and drained. A week later the vaginal incision was enlarged, but no further pus was obtained; still the patient ran a septic temperature. Blood cultures were negative. On June 11 she developed signs of pneumothorax, of which she finally died.

CASE XV. *Tuberculosis of Uterus and Adnexa; Post-operative Shock.*—G. F., 37 years old, died August 3, 1902. Patient was admitted to the hospital on July 29. On August 2 a hysterectomy was performed. In removing the left appendages a profuse hemorrhage occurred, due to separation of the layers of the broad ligament. On account of the poor condition of the patient, a thorough investigation into the cause of the bleeding could not be made. Packing was resorted to. The patient reacted poorly and failed to respond to vigorous and repeated stimulation. She died twelve hours after operation.

CASE XVI. *Uterine Polyp; Uterine Fibroids; Post-operative Shock.*—R. L., 42 years old, died August 14, 1902. The patient entered the hospital July 31. Examination revealed a large uterus with

a nodule in the anterior wall; a large, soft cervix presenting in its middle a red, hard mass three-quarters of an inch in diameter. On August 1 the polyp was removed by torsion and the uterus curetted. A few days after the operation the patient began to run temperatures ranging from 99° to 103° F. Examination showed a mass on the right side of the abdomen. On August 13 the mass was opened and a considerable amount of pus evacuated. At the same time a vaginal hysterectomy was done by morcellation. She died twenty-four hours after operation.

Case XVII. *Malignant Endocarditis; Streptococcemia.*—S. H., 28 years old, died September 15, 1903. Patient entered the hospital on September 14 in a comatose, septic condition with a temperature of 104° F. and pulse 140. Physical examination revealed nothing but a systolic murmur at the apex of the heart and subconjunctival and subcutaneous hemorrhages. Vaginal examination was negative. Blood cultures revealed streptococci. The postmortem examination showed a malignant endocarditis involving the mitral valve.

Case XVIII. *Carcinoma of the Ascending Colon; Retroperitoneal Abscess.*—R. K., 72 years of age, died October 15, 1902. The patient was admitted on September 17 with chronic intestinal obstruction due to carcinoma of the ascending colon. An ileosigmoidostomy, by means of a Murphy button, was done on September 18, after which the patient had no further obstruction of the bowels. The patient finally died on October 15 in a cachectic condition. The postmortem examination showed an ulcerating carcinoma of the ascending colon, with a posterior perforation into the retroperitoneal tissue, causing a large abscess cavity with necrotic walls.

Case XIX. *Appendicitis; General Peritonitis.* G. D., 18 years of age, died October 29, 1902. Patient entered the hospital on October 25 with a history of appendicitis. Examination showed a distended, tender abdomen, with marked tenderness in both iliac regions. An appendicectomy was performed and a small ovarian cyst was also removed. A general peritonitis with free fluid was found. The patient died four days after operation, of a general peritonitis.

Case XX. *Intestinal Obstruction Due to Fibrous Band During Pregnancy; Intestinal Resection.* —See Case VI. of Special Cases, page 456.

Case XXI. *Premature Labor; Septic Endometritis.*—R. G., 28 years old, died May 19, 1902. Patient developed an acute sepsis after a premature labor. She was admitted to the hospital on May 16, curetted, and died on May 19.

Case XXII. *Pelvic Abscess; Post-operative General Peritonitis.*—S. B., 25 years old, died June 7, 1902. Patient was admitted to the hospital on June 2 for acute pelvic peritonitis with abscess formation. On June 4 an abdominal incision was made, and an abscess in the broad ligament burst during manipulation. The peritoneum became accidentally contaminated. After the operation the patient developed a general peritonitis and died on June 7.

An analysis of these cases shows that they naturally group themselves primarily into two divisions—those which were operated upon and those which were not. Of the latter group, Cases I., VI., VIII., XVII., and XXI. were not subjected to operation, and all came into the hospital suffering from sepsis or were moribund at the time of admission. Five cases are thus at once deducted from the total of twenty-two deaths.

Of the patients who died of shock, Cases X. and XX. are discussed at length under the heading of Special Cases. Case XII. died of hemorrhage due to a ruptured tubal pregnancy which was not recognized, as described in the history, while Cases XV. and XIX. were weak and miserable patients, debilitated by their long suffering from tuberculosis. Case IV. died of exhaustion from the same cause, while an active myocarditis accounted for the death of Case V., and Case VII. died of a typical apoplexy for which the operation was undoubtedly the exciting cause. Case XVII. suffered from carcinoma with a perforation of the intestine, and Case XIX. entered the hospital with her fatal peritonitis. In all these cases the death of but one (Case XII.) can be attributed directly to the operation, unless we regard the operative intervention in Case VII. (apoplexy) as having been directly responsible for the patient's death. This gives us a total of thirteen cases out of twenty-two deaths in which the fatal issue would have occurred even if no surgical manœuvre had been practised.

Of the remaining eight cases, in all of which death intervened from sepsis (all but Case III., who entered the hospital in a septic condition), the fatal result in Cases XI., XIII., XVI., and XXII. is to be assigned directly to the operation, in Case XIII. a ruptured pyosalpinx being the starting point of the fatal sepsis. In Case II. fat necrosis was responsible for the fatal issue. In Case IX. the evil result was correctly attributed to the use of catgut which had been sterilized by a new method and which gave equally unsatisfactory

results in the other branches of the surgical service. Case XIV. died of a pyopneumothorax which cannot be attributed in any way to the treatment the patient received.

Of all the twenty-two deaths, therefore, there are but five which can be directly traced to operation; that is, but five in which the patient died as the result of the treatment, although even in some of these instances a fatal termination to the disease might have followed at a more remote time. Seventeen deaths were thus unavoidable and are to be assigned, not to the operative measures pursued, but to the diseases or conditions from which the patients suffered.

A SERIES OF NINE CONSECUTIVE CASES OF ECTOPIC GESTATION.

By Hiram N. Vineberg, M.D.,

ADJUNCT GYNECOLOGIST.

During my term of service in the summer of 1902 there occurred nine cases of ectopic gestation that were subjected to operation. As each case presented some feature of interest, I thought it might be of value to narrate the histories of the series, making such comments as the facts of the individual case might call forth.

Case I.—R. Z., aged 27 years; married three years; no children; one miscarriage two years ago, cause unknown. Admitted to the hospital August 16, 1902.

Last menstruation occurred three weeks ago. For some time past the patient has complained of pain in the right iliac region. Four weeks ago this pain grew worse and for two days there was incessant vomiting. The pain has continued.

On bimanual examination the uterus was found to be in a forward position. On the right side of the uterus and posterior to it a resisting globular mass, about the size of an orange, was felt. Shortly after the examination the patient was seized with a sharp, lancinating pain in the lower part of the abdomen. These pains persisted and about one hour later there was a slight uterine bleeding. On examination the tumor which had been felt before was no longer present; instead one felt a soft, fluctuating, irregular mass filling the pelvis posteriorly and pushing the cervix forward. The pulse became very frequent (104) and was rather small. Dr. M. G. Seelig, the house surgeon, properly diagnosed intraperitoneal hemorrhage and notified me at once. I responded immediately and on my arrival found the local condition had changed as above noted. The patient showed marked signs of anemia. She was at once taken to the operating room and prepared for laparotomy. On opening the abdomen there was a free escape of fresh blood and blood clots. The right tube and ovary were seized and brought into the incision, and it was found that the tube was the seat of an ectopic gestation at the ampulla portion. The tube and ovary were ablated, the blood clots removed as rapidly as possible, and the abdomen closed with tier sutures. The patient rallied promptly and made a good recovery.

In the foregoing case there was no delayed nor irregular menstruation—the *sine qua non*, according to some authors, of ectopic gestation. The menses had been regular, the last regular menstruation having occurred three weeks before admission to the hospital. The patient had had pelvic symptoms for several months, as manifested by pain in the right groin. On examination a semi-fluctuating tumor is found behind and to the right of the uterus. What was more natural than the diagnosis of ovarian disease? It was only after this examination, when symptoms of intraperitoneal hemorrhage were evident, that the diagnosis of ruptured tubal pregnancy was properly made by Dr. M. G. Seelig, the house surgeon. I fully concurred in this diagnosis as soon as I examined the patient a second time, a few hours after the first examination. The onset of the slight uterine bleeding helped to strengthen the diagnosis.

Case II.—M. L., aged 30 years; married eight years; three children and two abortions, last abortion in April, 1902. Admitted to hospital August 11, 1902. Had had an attack of pneumonia eighteen months ago and an attack of rheumatism in childhood. Three weeks ago, when she was two weeks overdue, she had slight uterine bleeding, which lasted two days. Some days later had cramp-like pains in the abdomen, which continued off and on for eight days. During this time had a slight show for one day. Since that time she has felt nauseated and rather weak. For the past few days she has been spotting off and on. On bimanual examination a mass, size of a closed fist, is felt behind and to the right of the uterus. The diagnosis of ruptured tubal pregnancy was made.

On opening the abdomen some free blood was found in the peritoneal cavity, and in addition a number of soft black clots in Douglas' cul-de-sac. The right tube was found to be the seat of the ectopic gestation. It and the corresponding ovary were removed. The left adnexa were found bound down by adhesions, which were separated and the adnexa left intact. The peritoneal cavity was cleaned of the clots and blood as well as possible and the abdomen closed. The patient made a good recovery.

Here we had a case presenting the classical symptoms of ectopic gestation—delayed menstruation, then irregular uterine bleeding, cramp-like pains in the abdomen, and an irregular mass at the side and behind the uterus. Unfortunately, instead of such cases being the rule, they form the exception, as will be noted in this series.

Case III.—M. S., aged 26 years; married seven years; three chil-

dren, last child four years ago; no miscarriages. Menses regular, the last occurring ten days prior to entering the hospital. Two days ago had a slight show, which continued for two days. Three weeks ago began to complain of stabbing pains in the right iliac region, which have persisted with more or less severity ever since. She has had no vomiting nor nausea. Yesterday noon had a distinct chill. The patient looks ill; the superficial mucous membrane very pale. Tongue moist and slightly coated. Temperature 101.4°, pulse 96. The abdomen is considerably distended and tympanitic everywhere. The uterus is moderately hard and is in a forward position. Behind the uterus one can feel a non-fluctuating mass, the size of a hen's egg, which is rather sensitive to the touch. A probable diagnosis of ectopic pregnancy was made.

On opening the abdomen the right tube was found to be the seat of the ectopic pregnancy and a considerable quantity of free blood was found in the general peritoneal cavity. The right tube and ovary were ablated, the patient making an uneventful recovery.

In this case, as in Case I., there was no delayed menstruation, but two days before admission, and eight days after the last menstruation, there was some slight uterine bleeding. We were then having such a run of cases of ectopic gestation in the ward that, on the strength of this and on the local findings, the house surgeon made a tentative diagnosis of extrauterine pregnancy—a diagnosis in which I concurred. The stabbing pain, the fever, and the abdominal distension pointed rather to an inflammatory process. The one symptom which was in favor of the diagnosis of ectopic gestation was the slight bloody show. Still, uterine bleeding may also accompany a salpingitis.

Case IV.—Mrs. C. B., aged 35 years; married sixteen years; two children, last child thirteen years ago. For years menses irregular as to time and as to duration; they recur every three, four, or five weeks and continue off and on for from four to seven days. Seventeen days ago began to have uterine bleeding. The preceding menses had recurred after an interval of four weeks and five days, but were decidedly more scanty than usual. During this period of uterine bleeding she has had more or less pain, but not of a severe character. Four days ago, however, she had severe cramp-like pains in the lower part of the abdomen and in both iliac regions. The pain now is referred chiefly to the right iliac region. Has had no vomiting nor nausea. On admission her temperature was 101° F. and pulse 96. On bimanual examination some fulness was made out in the right vaginal fornix. In front and to the right of the uterus a mass the size of an English walnut was detected, and it was quite tender to the

touch. The uterus was of normal size and in normal position. A probable diagnosis of ectopic gestation was made.

At the operation the right tube was found ruptured and the seat of the pregnancy, and, as the appendix was found to be adherent to the tubal mass, it was also removed. The patient made a slow recovery, as an exudate had formed about the stump which did not readily abort.

The difficulty in this case in arriving at a conclusion was the irregularity of the menstrual period normally. The patient seemed to attach no importance to the irregular and protracted bleeding, which had now been going on for seventeen days. She said such an experience was not unusual with her. It was only because we suspected ectopic pregnancy that we ascertained, on repeated questioning, that the menstrual period prior to the onset of the present flow was more scanty than usual. Only those who have to deal with a similar class of patients will fully realize the difficulties encountered in obtaining anything like a reliable history from those patients. And it is just in ectopic pregnancy that an accurate history is of such great value as an aid in the formation of a correct diagnosis.

Case V.—F. G., aged 38 years; married eighteen years; eight children, last child fourteen months old; no miscarriages. Menses set in at the fourteenth year, four-weekly type, amount moderate, duration two to nine days, not attended with pain. About two weeks ago she began to bleed after a cessation of menstruation for nine weeks. Shortly afterward she began to suffer from some abdominal pain, backache, chilly sensations. She was then admitted into one of the larger hospitals in the city, where she was curetted, presumably for a supposed miscarriage. She remained in this hospital for about ten days, and her friends had her then transferred to Mount Sinai Hospital, where she was admitted July 5, 1902. Her condition on admission was as follows: Moderately anemic, coated tongue, temperature 102.6°, pulse 112, abdomen moderately distended. On bimanual examination the uterus was found pushed forward against the symphysis by a large, irregular mass which filled the pelvis posteriorly and extended upward midway to the umbilicus. The mass was fluctuating in some areas, and in others was slightly nodular.

The diagnosis of a large hematocele, the result of a tubal pregnancy, was made. The case was considered a suitable one for vaginal section and drainage. Accordingly a good-sized incision was made in the posterior vaginal fornix and a large quantity of dark, tarry blood, with numerous dark blood clots, was evacuated. I passed my hand into the cavity and found projecting down its upper wall on the left side a soft, fleshy mass about the size of a hen's egg. Blood

in considerable amount seemed to be coming from this mass. I packed the cavity tightly with iodoform gauze and hastily opened the abdomen from above. The blood sac had thick, friable walls and was shelled out with some difficulty. The mass felt from below proved to be the ruptured left tube with a partially organized blood clot adherent to its interior. The tube and ovary were ablated. The right tube was now investigated and found to be changed into a hematosalpinx the size of a hen's egg. It was also removed. The uterus was ventrofixated and the space behind the uterus was tightly packed with iodoform gauze, the end of which passed into the vagina through the original incision. The abdomen was closed with tier sutures. The patient made a rapid and satisfactory recovery, leaving the hospital twenty-one days after the operation.

This case formed another instance of an ectopic gestation being mistaken for an early miscarriage, the error this time being committed in a prominent hospital. The error, no doubt, was recognized before the patient left the hospital, but the patient had lost confidence in the attending gynecologist and would not remain to submit to further surgical intervention.

Case VI. S. R., aged 22 years; married seven months. Admitted July 1, 1902. Menses appeared at fifteenth year, regular, four-weekly type, amount scanty, not attended with pain. Has never had any pelvic symptoms. No leucorrhea. Seven weeks ago had skipped her period for one week when she had a slight show, a mere spotting, but without any pain. A week later she had what she considered as her normal menstruation, though the amount was more scanty than usual. A few days later the slight bleeding appeared again and continued off and on until her admission to the hospital. About four weeks ago, that is, three weeks after the onset of the first bleeding, she was seized with severe cramp-like pains in the abdomen, which have persisted with more or less severity until now. The pain is referred chiefly to the left iliac region. The patient was moderately anemic. On bimanual examination the cervix was found rather soft; the body of the uterus could not be definitely outlined. To the left of the uterus was an indefinite mass, somewhat sausage-shaped and moderately sensitive. There was considerable resistance on that side, so that a satisfactory examination could not be made. Temperature on admission was 101.4°, pulse 96.

The diagnosis lay between an ectopic gestation and an early miscarriage with inflammatory disease of the left adnexa. On July 2 I made a posterior vaginal section, and, finding old blood clots, the wound was packed with gauze and a laparotomy was performed. The ruptured tube, surrounded by a blood clot, was firmly adherent to the posterior aspect of the left broad ligament. It and the cor-

responding ovary were removed with considerable difficulty and the abdominal wound closed with tier sutures. The patient made a satisfactory and uneventful recovery.

Taking all the evidence into consideration in the above case—the normal menstrual history prior to marriage, the onset of the symptoms so soon after marriage, the elevation of the temperature—the probabilities seemed to be in favor of its being a case of early miscarriage with gonorrheal infection of the left adnexa. It is in just such a case that the value of a posterior vaginal section for the purpose of diagnosis is so evident. For had it been only a miscarriage with gonorrheal infection of the left adnexa, the removal of the left adnexa would not have been indicated, for such moderate disease can usually be cured by other than surgical means.

Case VII.—B. H., 24 years of age, married two years, was admitted July 2, 1902. Her only child was 7 months old and she was nursing it. When the baby was 2 months old the menses reappeared. June 27, when she was thirteen days overdue, she began to bleed slightly, and since then almost every day there has been a slight show. It is only within the past twenty-four hours that she has had any abdominal pain, which she describes as resembling labor pains. Her temperature on admission was 102.6°, pulse 160. She was extremely exsanguinated, the superficial mucous membranes being blanched. The abdomen was moderately distended and gave a distinctly dull note in both flanks. On placing her on the side the dulness of the flank was replaced by a tympanitic note, giving unmistakable evidence of free fluid in the peritoneal cavity. The patient was at once subjected to a laparotomy. When the abdomen was opened a large stream of blood gushed out with some force. The left tube, which was the seat of the rupture, was quickly grasped, clamped, and removed. The liquid blood and clots were mopped up as rapidly as possible and the abdomen quickly closed. While the operation was in progress one of the staff gave an intravenous saline infusion. The patient, although almost pulseless for a time while on the operating table, rallied promptly within a few hours. She made a slow recovery, convalescence being complicated by a pleuritis on the right side, which gradually disappeared under palliative treatment.

This case presented the classical symptoms of ruptured tubal pregnancy, and, as an indication of how rarely cases present the classical symptoms, we must note that this is only the second one in the series. It is apparent, therefore, that the type described in the text books and frequently by writers forms the exception rather than the rule.

The case is of further interest in reference to the question whether such cases should be operated upon at once or operation be deferred until the patient rallies somewhat from the great loss of blood. On general principles the course pursued in this case should constitute the rule; that is, where you have a bleeding vessel, to lose no time in cutting down and securing it. Still, there are times when it is more prudent to wait for a few hours to see if the patient will rally somewhat.

Case VIII.—R. S., aged 28 years; married seven years. Admitted August 10, 1902. Menses set in at the thirteenth year, regular, four-weekly type, amount moderate, not attended with pain. Has one child, 6 years old. Has had no miscarriages. Two years ago she says she had an attack similar to the present. She then went two weeks overdue, when she began to bleed and had severe pain in the left iliac region. An operation was proposed then, which she refused. Had remained well until the present illness, which began two weeks ago. She was then two weeks overdue; that is, she had not menstruated for six weeks. The present attack set in with severe abdominal pains, but they were not severe enough to confine her to bed. About six days ago the pains were very severe for two hours, and now for the first time she had a slight show. The pains and the spotting have continued until the present. The patient was not anemic and her general condition was good. Her temperature was 100.6°, pulse 96.

On bimanual examination the uterus was found in a forward position and of about the normal size. To the right of the uterus and rather high up was a small mass about the size of a hen's egg, which was hard to the touch and rather tender. The house surgeon, Dr. M. G. Seelig, made the diagnosis of ectopic pregnancy, and I concurred in the diagnosis after seeing and examining the patient.

When the abdomen was opened considerable free blood, together with clots, was found in the peritoneal cavity, due, no doubt, to rupture of the tubal fleshy mole during the pelvic examination by several of the staff. The right tube was found to be the seat of the ectopic sac. It and the corresponding ovary were removed, the patient making an uneventful recovery.

The noteworthy feature of this case is the attack two years prior to the present one, and which the patient said gave rise to exactly similar symptoms. There was a difference, however, in that the uterine bleeding was decidedly more profuse, and, as she stated, several blood clots were expelled. The probabilities are that what she had then was an early miscarriage. However, the profuse uterine bleeding must not be

taken as a pathognomonic sign between an early miscarriage and the bleeding which usually attends rupture of an ectopic gestation, as has been done by some writers. I have seen as severe uterine hemorrhage accompanying the latter condition as would occur in any case of uterine miscarriage. Still, as a rule the bleeding attending a tubal pregnancy is slight and one of its characteristics is that it is seldom continuous; it comes and goes, and may entirely cease for one or two days at a time.

Case IX.—N. L., aged 30 years, was admitted July 2, 1902; married eleven years; has one child, 8 years old; has had several miscarriages, which she brought on. I had occasion to curette her twice for sepsis following two of the miscarriages, last one two years ago. Frequently when she would skip a period for a day or two she was in the habit of passing an instrument (or having some one pass it for her) into the uterus, with the much-wished-for result. In the latter part of May—that is, about six weeks before her admission into the hospital—when she was three weeks overdue, she took medicine to bring on her menses. A scanty flow did set in. This continued for about two weeks, but, not being satisfied with the amount, she had an instrument—probably a sound—passed into the uterus. This brought on a good flow, corresponding in amount to that which she had had with former miscarriages, and she felt that she had gotten rid of her pregnancy. The flow ceased entirely June 20 and has not recurred since. She had had absolutely no pain until the attack of illness on the day preceding her admission into the hospital. This attack was as follows: She had partaken rather generously of lobster salad on the night preceding, and felt somewhat nauseated on the next morning when she awoke. But as the day wore on the nausea disappeared. For luncheon she had eaten some cheese cake. She had scarcely finished eating when she felt faint, and soon passed into a condition of syncope. A medical friend, who happened to be in the house at the time, gave her several stimulating hypodermatics, and in the course of a few minutes she rallied and then vomited. When she was fully restored to consciousness she complained of the most agonizing pain in the region of the epigastrium and right hypochondrium. The pain was so severe that she was unable to move, and it was only after a hypodermatic of morphine had been given that she would suffer any one to remove her clothes and put her to bed. On the next day she was brought to the hospital in an ambulance.

I saw her shortly after she was admitted. She was not anemic. Her general condition seemed good. Temperature 101.4°, pulse 120 and of fairly good volume. The abdomen was moderately distended and was rather rigid on the right side. She complained of pain chiefly in the right umbilical region, and there was marked tenderness over the region of the cecum. On bimanual examination the uterus was high up in the pelvis and was not appreciably enlarged. On the right

side above the brim of the true pelvis a small globular mass could be distinctly felt, apparently not larger than an English walnut.

I could not make a definite diagnosis; the weight of evidence seemed to be in favor of an acute appendicitis, although ectopic gestation was considered and could not be excluded. In view of the uncertainty in the diagnosis and the apparent abatement of the more violent symptoms, it was thought wise to keep the patient under observation. On the next day (July 3) there was a decided improvement in all the symptoms; the pain was less, the temperature had fallen to 99.8° and the pulse to 100-104. This seemed to further favor the diagnosis of appendicitis, and I was beginning to entertain the hope that operative intervention could be deferred until the so-called interval operation could be done. On the morning of July 4 (that is, one day later), while making a rapid tour of the ward preparatory to my leaving the city for the day, I was struck with the patient's changed appearance. She looked decidedly ill and she stated she did not feel as well as on the day before. Her temperature had gone up to 103.8° and pulse to 160. On bimanual examination I could make out that the mass on the right side had somewhat increased in size and volume, and was now the size of a small hen's egg. I decided to operate at once. When the patient was on the operating table and was about to be subjected to the usual washing-up, one of the attending staff on the surgical side happened to be present and asked permission to examine the patient bimanually, which I granted. He remarked that he could not feel the mass which I said was present, whereupon I examined the patient and to my surprise could not feel it either. I stated that the mass had evidently been ruptured and that no time should be lost in opening the abdomen. It did not take many minutes before this was done, and the hemorrhage that I encountered was one of the most alarming that I had ever witnessed. The right tube was quickly caught and clamped, and, as the appendix was adherent to the tubal mass and secondarily involved, it also was removed, as well as the tube and ovary. It was only by opening the veins in both arms and infusing two litres of saline solution that the patient was made to rally. For several minutes while I was operating the anesthetist told me that he could not feel any pulse. The patient reacted satisfactorily a few hours later, but her recovery was slow, owing to the profound anemia and to the development of an exudate about the stump. This, however, completely disappeared in the course of a few weeks, and when the patient was discharged on August 10 she was in good condition, barring a moderate anemia.

The whole clinical picture in the above case pointed to an attack of acute appendicitis—the indiscretion in diet the night before, the sudden onset, the fainting spell (though the latter symptom is more indicative of intraperitoneal hemorrhage in ectopic gestation, as I pointed out some years ago), the severe pain at the pit of the stomach,

the rise in temperature, and the subsequent limitation of the pain to the right umbilical region, together with the physical sign of decided tenderness in the region of the appendix. The mass felt on bimanual examination could, from its situation, readily have been an appendiceal tumor. The only suspicious feature was the irregular hemorrhage, but she had denied having skipped a period or having tampered with herself. This was a confession she made only some time after the operation, and even had we known it before the operation the course of events might just as well have indicated an early provoked abortion. In fact, for the two weeks prior to the attack all uterine bleeding had ceased.

In taking a general survey of the cases of the series, one is struck with the feature that in all but two (Cases I. and II.) there was more or less elevation of temperature. In two cases (V., VII.) the temperature had reached 102.6°, and in one case it rose to 103.8°. It is generally taught that in the differential diagnosis between inflammatory disease of the adnexa and ectopic pregnancy the thermometer is of great aid, in that it usually shows an absence of fever in the latter condition. A series of cases like the foregoing disproves such teaching. It is evident, therefore, that we still have a good deal to learn in ectopic pregnancy, even from the clinical side.

TUBERCULOSIS OF VAGINAL PORTION OF THE CERVIX AND OF THE ENDOMETRIUM, ASSOCIATED WITH TUBERCULAR DISEASE OF THE ADNEXA; HYSTERECTOMY; DEATH.

By Hiram N. Vineberg, M.D.,
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Mrs. G. F., aged 37 years, married nineteen years, had nine children and no miscarriages. Menses set in at the age of 12 years, were regular, moderate in amount, and not attended with pain. She was admitted to the Mount Sinai Hospital July 29, 1902. Her family history was negative. Two years and a half ago she had had pleurisy and effusion, for which she was tapped. This and another attack of pleurisy about six months ago were her only illnesses until the present one, which began about three weeks ago with pain in lower part of the abdomen and with fever. She has been confined to bed since then. The menses have not recurred for two months, and she has had no chills, no night sweats, no cough, no hemoptysis, no dyspnea, no edema of legs. She has lost considerable flesh and strength. Upon admission she showed a sallow complexion and was very much emaciated. Temperature was 99° F. in the morning and 102° F. in the afternoon. Her tongue was coated with a white fur. There was retraction above and below the clavicles on both sides. There was some dulness over both apices behind. No cough. No sputum. There was a systolic murmur in the third interspace near the sternum, probably hemic. On vaginal examination the uterus is found enlarged to the size of a gravid uterus at the sixth or seventh week. There is a mass to the left and behind the uterus, the size of a hen's egg, which is very firmly fixed to the uterus. The right tube is about the thickness of the thumb.

Upon ocular inspection the cervix is considerably enlarged, the hypertrophy being most marked in the anterior lip, which presents three large ulcerations. The ulcers are irregular in outline, moderately deep, and covered with a dirty-grayish exudate. They are separated from one another by a very narrow strip of mucous membrane of a rather bright-red color. There is no marked induration of the lip, no friability of the tissues, and no tendency to bleed on being touched. There is a thick, tenacious, grayish-yellow discharge from the external

os. I made the diagnosis of tubercular ulceration of the vaginal portion, with probable tubercular disease of the adnexa. The absence of menstruation for two months, associated with enlargement of the uterus, gave rise to the suspicion of pregnancy. Repeated examination of the discharge from the surface of the ulcers and from the cervix did not show any tubercle bacilli. Although I had never seen a case of tubercular ulceration of the cervix, I adhered to my diagnosis, which I had reached by a process of exclusion, in spite of the negative results of the bacteriological examinations. The pathologist, however, was enabled to report, in the course of a few days, that the lesion was tuberculous, from a fragment of tissue which I had gouged out with the sharp spoon from the surface of one of the ulcers. For the four days prior to the operation the temperature ranged from 100° to 103° F., the pulse from 110 to 130. The ulceration extended slowly to the posterior lip during the four days the patient was under observation in the hospital.

The operation proved to be very difficult, owing to the firm adhesions of the left tubo-ovarian mass to the pelvic wall. When the mass was finally enucleated it was very difficult to stop the oozing, even after the uterine vessels were secured and the uterus was removed. The loss of blood and the severity of the operation proved to be too much for the patient, who was cachectic and emaciated, and she died six hours after the operation from cardiac weakness.

No autopsy was permitted. On bisecting the uterus a perfect specimen of tuberculosis of the endometrium was obtained. The mucosa was double the normal thickness. It had a soft, velvety appearance and was thrown into numerous longitudinal folds. On very close inspection small, fresh tubercles could be seen on the summit of the folds. The mucosa of the cervix was equally involved. Tubercle bacilli were readily found in the endometrium. The left adnexa were indistinguishable as such, forming an abscess sac, the pus of which contained tubercle bacilli in abundance. The right tube was enlarged to the size of the index finger and was filled with pus which contained tubercle bacilli. The right ovary was embedded in adhesions and was considerably below the normal size.

Tuberculosis of the vaginal portion of the cervix is a very rare condition, even as a secondary affection to tuberculosis of the endometrium. As a primary disease it is of course very much less frequently observed. In a fairly comprehensive search of the literature I have been able to find only the following cases: Klob, one case[1]; Friedländer, one case[2]; Kaufman, one case[3]; Fraenkel, one case[4]; Spaeth,

[1]Pathol. Anat. d. weibl. Genital, 1864.

[2]Volkmann's klin. Vorträge, No. 64.

[3]Zeitsch. für Geb. u. Gyn., Bd. xxxvii., p. 119.

[4]Jahr. d. Hamburger Staatskrankenanstalten, 1893-94.

one case[5]; Lewers, one case[6]; F. S. Matthews, one case[7]; Driessen, one case[8]. There is some doubt in reference to this case, inasmuch as the patient had a fistula in ano and the disease of the cervix may have been secondary to it. The total number of cases of primary tuberculosis of the cervix therefore thus far recorded is seven.

The case here reported must be looked upon as secondary to tuberculosis of the uterus and tubes, which in its turn was probably secondary to a healed or quiescent tuberculosis of the lungs. The two attacks of pleurisy within a period of two and a half years doubtless had a tubercular basis. Still a phthisical patient may, through the medium of her fingers, in very rare instances, infect her genital organs, and thus bring about a primary tuberculosis of them[9].

Primary tuberculosis of the genital organs in women may occur as follows:

1. The entrance of the tubercle bacilli directly into the mucous membrane of the vulva, vagina, cervix, body, and tubes, and through the latter to the peritoneum and ovary.

2. The entrance of the tubercle bacilli through small abrasions in the genital canal into the paravaginal and parametric lymph channels, and the extension of the germs through these to the pelvic peritoneum and thence to the tubes or directly to the tubes (Hegar).

3. The transmission of the tubercle bacilli through the blood current directly to the genital organs (hematogenic form).

Secondary genital tuberculosis arises from a primary focus situated in a caseous gland in any part of the body (most frequently the bronchial), the metastasis occurring through the blood or lymph currents or by contiguity, and it may arise through contact with a secretion containing tubercle bacilli from a tuberculous organ, as, for instance, the discharge from tuberculosis of the intestine, or the urine in tuberculosis of the urinary organs (Amann, Jr.). The association, however, of tuberculosis of the two systems, the genital and the urinary, in women is very rare. I have seen a fairly large number of urinary tuberculoses in women, and have not as yet seen a case in which the two systems were affected with tuberculosis in the same person.

Until the publication of Hegar's article in 1886 tuberculosis of the

[5]Inaug. Diss., Strassbourg, 1885.
[6]Jour. of Obst. and Gyn. of the British Empire.
[7]Operated upon by Dr. George M. Tuttle, Medical Record, Dec. 17, 1898.
[8]Centl. f. Gyn., 1898, No. 28.
[9]Hegar, Alterthum.

uterus was considered as a pathological rarity. Since then the number of cases recorded in the literature has grown to considerable dimensions. Vassmer[10] alone was able to collect six cases of tuberculosis of the uterus in Runge's clinic in a period of ten months. In some of his cases tubercle bacilli were found in the scrapings obtained through curettage when such a disease was not at all suspected. The lesson to be learned from this is that uterine scrapings should be systematically searched for tubercle bacilli.

Most of the cases of tuberculosis of the cervix found in the literature had been diagnosed as carcinoma prior to operation. When the tuberculous affection occurs in the form of a cauliflower-like growth, as it frequently does, its resemblance to a cancerous growth is very striking.

T. S. Cullen, in his incomparable work "Cancer of the Uterus," page 192,[11] draws attention to this source of error in the differential diagnosis of squamous-cell carcinoma of the cervix, and reports some cases in which this error in diagnosis had been made.

A second variety of tuberculosis of the cervix occurs in the form of flat ulcers with a grayish exudate, as in the case here reported.

A third and the most frequent variety occurs in the form of miliary tubercles on the vaginal portion, as also on the cervical mucosa, and from here the tubercles may penetrate the whole thickness of the cervical wall (Vassmer).

A fourth variety occurs in the form of a bacillary catarrh, in which the process is localized to the superficial epithelium and glands, the latter being filled with cheesy masses containing numerous tubercle bacilli.[12]

The absence of menstruation in my case for two months, associated with enlargement of the uterus, is an interesting phenomenon and led to the natural suspicion of pregnancy. Amenorrhea in tuberculosis of the uterus occurs only in a very advanced stage of the disease, when the entire endometrium has undergone caseation. As a rule, instead of amenorrhea, the patient suffers from menorrhagia or metrorrhagia. In accordance with the condition of the endometrium that was found on bisecting the uterus, these symptoms (uterine bleeding) should have obtained. It is probable that the condition of the ovaries—one being converted into an abscess sac, the other embedded in adhesions and atrophic—may have accounted for the amenorrhea. The occur-

[10]Archiv. f. Gyn., Bd. lvii., p. 301.
[11]D. Appleton & Co., 1900.
[12]Schütt, Inaug. Diss., Kiel, 1889.

rence of pregnancy in tuberculosis of the uterus is not an improbable event; such cases have been recorded by Thorn.[13] Mosler,[14] and Schmorl and Kockel.[15] Casper (cited by Mosler) reports a case in which there occurred spontaneous rupture of the uterus at the third month of pregnancy. Thorn, Schmorl, and Kockel have each reported a case of tuberculous endometritis in which the pregnancy went to full term, and the tuberculous disease of the endometrium had even advanced to the stage of caseation.

[13]Inaug. Diss., Berlin, 1894.
[14]Inaug. Diss., Breslau, 1883.
[15]Beiträge zur. path. Anat. und allg. Path., Bd. xvii.

EYE AND EAR STATISTICS.

December 1, 1900, to December 1, 1901.

EMIL GRUENING, M.D.,
ATTENDING SURGEON.

C. H. MAY, M.D., AND C. KOLLER, M.D.,
ADJUNCT ATTENDING SURGEONS.

1. Lachrymal Apparatus.

	CASES.
Dacryocystitis	1
Lachrymal fistula	1

2. Globe and Orbit.

Glaucoma simplex	1
Chronic glaucoma	12
Acute glaucoma	2
Subacute glaucoma	1
Orbital periostitis (syphilitic)	1
Cicatricial contraction of orbital stump	3
Traumatism	1
Empyema of ethmoid cells	1
Empyema of frontal sinus	1

3. Lens.

Senile cataract	15
Morgagni "	1
Soft "	1
Secondary "	5
Traumatic "	2
Diabetic "	1

4. Muscles and Nerves.

Convergent strabismus	5

5. Lids and Brow.

Distichiasis	1
Entropion	4
Trichiasis	1
Supraorbital oil cyst	1
Trachoma	14
Cicatricial contraction of lid	3
Empyema of orbit and lid	1

6. Cornea.

	CASES.
Ulcerative keratitis	12
Traumatic keratitis with hypopyon	2
Penetrating wound of cornea	1
Leucoma	2
Traumatic laceration	2

7. Conjunctiva.

Chronic catarrhal conjunctivitis	1
Granular "	2
Koch-Weeks "	1
Phlyctenular "	2
Blepharospasm	1
Pterygium	2
Granuloma of conjunctiva	1

8. Retina and Optic Nerve.

Glioma	1

9. Iris and Ciliary Body.

Iridocyclitis	1
Total synechiæ	1
Sarcoma of iris	1
Chronic iritis	1
Rheumatic "	1
Acute "	1
Cyclitis dolens	1

10. Choroid and Vitreous.

Suppurative choroiditis	1
Disseminated "	1

11. Miscellaneous.

Total blindness from bullet wound of head	1

DISEASES OF THE EAR.

1. Auricle.

	CASES.
Postauricular abscess	1

2. Eustachian Tube and Middle Ear.

Acute otitis	4
" " complicating mastoid	1
Chronic otitis	4
" " with brain abscess.	1

3. Mastoid Disease and Complications.

	CASES.
Acute suppurative mastoiditis	17
" " " periauricular abscess	1
Chronic mastoid fistula	1
Chronic suppurative mastoiditis	11
Subacute mastoiditis	8
Septic thrombosis of lateral sinus.	1
Acute mastoiditis with meningitis.	4
Tubercular mastoiditis with meningitis	1

OPERATIONS ON THE EYE.

1. Lachrymal Apparatus.

Incision and cauterization of lachrymal fistula	1

2. Lids and Brow.

Hotz's operation for entropion	4
Enucleation of supraorbital oil cyst	1
Expression of trachoma granules.	14
Plastic for cicatricial contraction.	3
Streatfield operation for entropion	1

3. Sclera.

Sclerotomy for glaucoma simplex.	1

4. Conjunctiva.

Excision of pterygium	1
Excision of granuloma	1

5. Cornea.

Incision and drainage of hypopyon	2
Cauterization of ulcer (iodine)	2
" " " (cautery).	2
Tattooing of leucoma	2

6. Muscles.

Tenotomy of internal rectus, advancement of external rectus.	3
Tenotomy of internal rectus	2

7. Iris.

Iridectomy for chronic glaucoma.	9
" " senile cataract	5
" " complete synechiæ	1
" " subacute glaucoma	1
" " trauma to globe	2
" " acute glaucoma	1
" " secondary cataract	2
Excision of prolapse after trauma.	1

8. Lens.

Extraction for senile cataract	12
" " Morgagnian cataract	1
Secondary discission	5
Excision of sarcoma of iris	1
Needling of soft cataract	1

9. Globe and Orbit.

Wolff's skin graft of orbit	3
Exploration of ethmoid cells (empyema)	1
Exploration of frontal sinus (empyema)	1
Enucleation (panophthalmitis)	1
" (suppurative choroiditis)	1
Enucleation (traumatic glaucoma)	1
Enucleation (cyclitis dolens)	1

OPERATIONS ON THE EAR.

1. Auricle.

	CASES.
Incision and drainage of periauricular abscess	1
Incision and drainage of postauricular abscess	1

2. Membrana Tympani.

Paracentesis	18

3. Mastoid and Complications.

Simple osteotomy	31
Incision and drainage of subperiosteal abscess	1
Curettement of chronic mastoid fistula	1
Radical mastoid operation	10
Exploration of lateral sinus and meninges	13
Aspiration of brain	2
Lumbar puncture for suspected brain abscess	1

OPERATIONS ON THE THROAT.

Adenoids, avulsion of	5
Hypertrophied tonsils, abiation	2
Nasal polyp, avulsion of	1
Thyroid tumor of tongue (excision)	1

EYE AND EAR STATISTICS.

December 1, 1901, to December 1, 1902.

DISEASES OF THE EYE—212 CASES.

	Cured	Improved	Unimproved	Died	Total
1. Lachrymal Apparatus.					
Dacryocystitis	1	1	..	..	2
2. Globe and Orbit.					
Acute glaucoma	..	2	..	..	2
Chronic "	..	12	..	..	12
Phthisis bulbi	1	..	..	..	1
Acute tenonitis	1	..	..	..	1
Gunshot wound of eyeball	1	..	..	..	1
Foreign body in eye—panophthalmitis	..	1	..	..	1
Myopia	1	..	..	..	1
3. Lens.					
Senile cataract	12	..	..	..	12
Diabetic "	1	..	..	..	1
Traumatic "	4	..	..	..	4
Secondary "	7	..	..	..	7
4. Muscles and Nerves.					
Convergent strabismus	3	..	..	..	3
" " (both eyes)	12	..	..	..	12
Divergent "	2	..	..	..	2
5. Lids and Brow.					
Trachoma	104	5	..	..	109
Trichiasis	5	..	..	..	5
Entropion	1	..	..	..	1
Edema of lids	1	..	..	..	1
Ptosis (bilateral, acquired)	1	..	..	..	1
Sarcoma of lid	1	..	1	..	1

	Cured.	Improved.	Unimproved.	Died.	Total.
6. Cornea.					
Interstitial keratitis	..	2	..	..	2
Fascicular "	1	..	..	..	1
Hypopyon "	..	1	..	..	1
Corneal ulcer	2	..	..	..	2
Pannous keratitis	..	2	..	..	2
Penetrating wound of cornea	1	..	..	..	1
7. Sclera.					
Incised wound of sclera	1	..	..	..	1
8. Conjunctiva.					
Phlyctenular conjunctivitis	1	..	..	..	1
Granuloma of conjunctiva	1	..	..	..	1
Skin adherent to "	1	..	..	..	1
9. Retina and Optic Nerve.					
Optic neuritis	3	..	1	..	4
Toxic optic neuritis	1	1	..	..	2
Detachment of retina	..	2	..	..	2
Glioma " "	1	..	..	..	1
Retinitis proliferans	..	1	..	..	1
10. Iris and Ciliary Body.					
Iritis	..	1	..	..	1
Tubercular iritis	..	1	..	..	1
Anterior synechiæ	2	..	..	..	2
Occlusion of pupil	1	..	..	..	1
Cyclitis	3	..	..	..	3
11. Choroid and Vitreous.					
Hemorrhage into vitreous	..	1	..	..	1
Total					212

DISEASES OF THE EAR—42 CASES.

	Cured.	Improved.	Unimproved.	Died.	Total.
1. Middle Ear.					
Acute otitis media	5	..	..	..	5
Chronic " "	..	..	2	..	2

	Cured.	Improved	Unimproved	Died.	Total.
2. Mastoid Process.					
Acute suppurative mastoiditis	23	..	..	..	23
Subacute " "	2	..	..	..	2
Chronic mastoiditis with fistula	5	1	..	..	6
3. Mastoid and Complications.					
Acute mastoiditis; pyemia	1	..	..	..	1
Suppurative mastoiditis and sinus thrombosis	1	..	..	..	1
Sinus thrombosis	1	..	..	..	1
Chronic mastoiditis; sinus thrombosis; extradural and cerebellar abscess	..	..	..	1	1
					42

DISEASES OF NOSE, THROAT, AND SINUSES—11 CASES.

	Cured.	Improved	Unimproved	Died.	Total.
Nasal exostosis	1	..	..	..	1
Syphilis of nose	..	1	..	..	1
Adenoids	2	..	..	..	2
Hypertrophied tonsils	1	..	..	..	1
Acute suppurative epiglottitis	1	..	..	..	1
Syphilitic stenosis of larynx	1	..	..	..	1
Perforating empyema of frontal sinus	1	..	..	..	1
Empyema of frontal and of the maxillary sinus	1	..	..	..	1
Post-operative non-closure of ethmoidal sinus	2	..	..	..	2
					11

OPERATIONS ON THE EYE—203.

	CASES.
1. Lachrymal Apparatus.	
Incision for dacryocystitis	2
2. Eyeball.	
Removal of foreign body	2
3. Lids and Brow.	
Scarification and expression for trachoma	104
Hotz's operation for trichiasis	3
Streatfield-Snellen-Herbert operation for entropion	1
Panas' operation for ptosis	1
Tarsectomy and suture for ptosis	1
Jaesche-Arlt operation for trichiasis	3
Canthoplasty	1
Removal of section of tumor of lid for diagnosis	1

4. Conjunctiva.

	CASES.
Removal of granuloma	1
" " foreign body	1
Excision of skin adherent to conjunctiva	1

5. Cornea.

Cauterization of ulcer of cornea with actual cautery	3

6. Sclera.

Suture of incised wound of sclera	1

7. Muscles.

Tenotomy of internal rectus for convergent strabismus	8
Stretching and tenotomy of internal rectus (Panas)	14
Tenotomy and advancement	4
" of external rectus	3
" " superior "	1
" " inferior "	1

8. Iris.

Iridectomy for acute glaucoma	2
" " chronic "	9
" preparatory to cataract extraction	4
" for prolapsed iris	2
" and division of anterior synechiæ	1
Iridotomy for occlusion of pupil	1

9. Lens.

Simple extraction for senile cataract	9
Combined " " " "	2
" " " traumatic "	4
" " " diabetic "	1
Linear extraction for myopia	1
Discission for secondary cataract	11

10. Globe and Orbit.

Evisceration for iridocyclitis	1
Enucleation for glioma of retina	1
" " traumatic iridocyclitis	2
" " cyclitis	2
" " phthisis bulbi	1
" " injury following gunshot wound	1
Removal of cartridge from the eye	1

11. Miscellaneous.

Resection of superior cervical ganglion for double optic neuritis	1
Total	203

OPERATIONS ON THE EAR—50.

1. External Auditory Canal.

	CASES.
Plastic secondary to mastoid operation	1

2. Membrana Tympani.

Paracentesis	9

3. Mastoid and Complications.

Incision of abscess	1
Revision of mastoid sinus	2
Osteotomy for acute suppurative mastoiditis	24
" " double mastoiditis	2
" " subacute "	1
" " mastoiditis and perisinuous abscess	1
" and curettement for sinus thrombosis	1
" " drainage for mastoiditis, sinus thrombosis, and brain abscess	1
Radical operation for mastoiditis (Stacke)	3
Exploratory osteotomy for suspected sinus thrombosis	1
Incision of abscess in posterior cervical triangle	1
Ligation and excision of internal jugular for sinus thrombosis	2
	50

OPERATIONS ON THE NOSE, THROAT, AND SINUSES—9.

Removal of nasal exostosis	1
" " section from turbinated bone for diagnosis	1
Curettement for adenoids	2
Tonsillotomy for hypertrophied tonsils	1
Incision of epiglottis for suppurative epiglottitis	1
Tracheotomy for syphilitic stenosis of larynx	1
Osteotomy and drainage for empyema of frontal sinus	1
" " " " " " " and maxillary sinuses	1
	9

Total number of operations on eye, ear, nose, throat, and accessory sinuses. 262

ORBITAL CELLULITIS; EMPYEMA OF THE ETHMOID CELLS AND THE FRONTAL SINUS; ABSCESS OF THE FRONTAL LOBE; PNEUMOCOCCEMIA; DEATH.

By E. Gruening, M.D.,
OPHTHALMIC AND AURAL SURGEON.

The patient whose case is here related suffered from chronic suppuration of the ethmoid cells and the frontal sinus. He became infected by a pneumococcus invasion, the portal of infection being the nose. From here the infection travelled to the ethmoid cavities, the orbit, and the brain, passing by the frontal sinus. This fact was demonstrated clinically by the absence of tenderness in the region of the frontal sinus, and bacteriologically by the sterility of the purulent contents. The pus taken from the nose, the ethmoid, the orbit, and the brain contained the pneumococcus. If in the descriptive title of this paper "orbital cellulitis" occupies the first place in the complex symptomatology of the case, it may be explained by the circumstance that it was the orbital affection with its inherent protrusion of the eyeball which caused the patient to be admitted to the eye wards of the hospital and brought him under my care.

L. S., 26 years of age, a butcher, was admitted to the Mount Sinai Hospital on March 29, 1903. His left eye was chemotic and both lids were swollen. The motility of the eye upward was impaired and the globe was forced downward and forward. The pupil of the left eye was slightly larger than that of the right. Ophthalmoscopic examination negative. Marked tenderness over ethmoid bone, no tenderness over frontal sinus. Between the left middle turbinated body and the outer wall of the nose a layer of white pus. Temperature 103.8°, pulse 76, respiration 26.

Lungs, heart, spleen, and ears normal. The patient was in a stuporous condition and could not be questioned as to the history of his disease. His relatives stated that six days ago he awoke in the early hours of the morning with much headache and pain in the left eye. The first three days he had chills and fever and a copious discharge from his nose. The pain in the left eye persisted,

and after some time the patient became delirious and finally stuporous.

On the day of admission, March 29, the patient was anesthetized and operated upon. An incision down to the bone was made along the upper and inner orbital margins. The periosteum of the os planum and of the roof of the orbit was softened and perforated at several points. The entire os planum was carious, and the cavities of the ethmoid were full of pus and granulation tissue and communicated with the orbit, which also contained much pus. The lachrymal gland was displaced and lay in a pool of pus. The outer layer of the orbital process of the frontal bone forming the roof of the orbit was softened and discolored. It was therefore removed and the frontal sinus was entered from the orbit. The cavity of the sinus contained thickened mucous membrane, a quantity of pus, many mucous polypi, and an exostosis springing from the inner table of the orbital process. The sinus was then cleared of its pathological contents. The remaining bony walls appeared sound and no communication could be found either with the sinus of the other side or the cranial cavity. Here the operation ended, and the large resulting cavity was loosely packed with iodoform gauze. A rubber drainage tube was carried through the nose and a moist dressing applied.

The following day, March 30, the patient appeared but little improved. His mind was not clear; stupor and delirium alternated. The pulse ranged from 64 to 92, the temperature from 101.8° to 103.60°. At the first dressing all packings were removed and renewed moist.

March 31: Patient delirious the greater part of the day. At times he was quiet and answered questions rationally. In the course of the day the temperature rose to 105.4°, with pulse 90 and respiration 28. He had a severe chill lasting twenty minutes. Leucocyte count, 33,000. Lumbar puncture: 55 c.c. were obtained. Fluid clear. Spreads negative. Culture negative. Late in the evening the patient had another chill. The temperature rose to 107.2°, pulse 124, respiration 28. Sponge bath reduced the temperature to 105.8°. Packings removed. Profuse seropurulent discharge from wound. Packings renewed. Cultures from pus of orbit, ethmoid, and nose: Pneumococcus. Culture from pus of frontal sinus: No growth.

April 1: Involuntary urination and defecation. Temperature 106.2°, pulse 96, respiration 34. Patient in deep coma. Ophthalmoscopic examination: Decided redness of left disc and considerable dilatation of retinal veins. In view of the negative character of the spinal fluid, it was decided to explore the brain.

Osteotomy for Exploration of the Brain.—No anesthesia. The original incision along the inner margin of the orbit continued upward over the forehead, and the skin and periosteum of the flap were turned back. The inner plate of the orbital process was removed

and the dura mater exposed. A stream of foul-smelling pus poured into the orbit. The dura mater was discolored and perforated on the under surface of the frontal lobe, and through the opening in the dura the pus continued to flow. After enlarging the opening in the dura the finger was carried through it into a large pus cavity which had no limiting membrane. A dressing forceps was introduced into the abscess cavity and opened at various points. A number of pockets containing pus were emptied. The outer wound was flushed, but the abscess cavity was not irrigated. It was drained by means of narrow strips of moist selvaged gauze. Culture from brain abscess: Pneumococcus.

Immediately after the operation the patient answered questions rationally but slowly; the temperature fell to 103.4°, and in the course of the night to 99.6°. Early in the morning of the following day the patient had a violent chill and lost consciousness. The temperature rose to 105.8°, pulse 164, respiration 50. Involuntary urination. Pulse very weak. Subcutaneous injection of hot normal salt solution. In the afternoon the patient had a general convulsion lasting two minutes, and later another lasting one minute.

April 3: Temperature 106°. Comatose. Involuntary urination. General convulsion lasting five minutes. The wound discharged purulent material and necrotic brain tissue.

April 4: Deep coma. Temperature 106.2°, pulse 168. Chill lasting ten minutes. Subcutaneous infusion of salt solution. Respiration rapid, but lungs negative. Had five convulsions to-day. The wound continued to discharge foul-smelling pus and necrotic brain tissue. Wet dressings renewed. Report of blood culture taken April 2: Pneumococcus in plates and flasks.

April 5: Coma persists. Had thirteen convulsions to-day; total time, thirty-one minutes. White blood count, 20,000. Unable to swallow. Fed by gavage. Temperature from 102.8° to 103°. Respiration rapid—50 to 60. At right base of lung large area of dulness. Bronchial voice and breathing. Mucous subcrepitant râles. At 10 o'clock pulmonary edema. Cups applied. Edema less marked. Foul discharge from wound.

April 6: Five convulsions since midnight. Pulse at times imperceptible. Died at 7.30 P.M. No autopsy.

ABSCESS OF THE LEFT TEMPORO-SPHENOIDAL LOBE; OPERATION; RECOVERY.[1]

By E. Gruening, M.D.,
OPHTHALMIC AND AURAL SURGEON.

The symptoms which led to the diagnosis of abscess of the temporo-sphenoidal lobe in the patient under consideration were rapid development of choked disc, slow pulse rate, intense headache, and vomiting. The important localizing symptom of abscess of the left temporo-sphenoidal lobe, amnesic aphasia, was absent before the operation, but appeared immediately after it. Other interesting features of the case were, (1) the discharge of pus from the abscess cavity, followed by the flow of a clear watery fluid, evidently ventricular; (2) the rapid recovery of the patient in spite of the communication of the abscess cavity with the ventricles of the brain.

J. K., aged 17, an Austrian by birth and a farrier by trade, was admitted to the Mount Sinai Hospital April 15, 1903. He complained of pain behind the left ear. During the past three days he has had several chills. Both ears have been discharging a long time, he did not know how long, and the left ear always more than the right. On admission he suffered from frontal headache and photophobia. The left mastoid region was tender upon deep pressure, and the corresponding middle ear was filled with granulations and cholesteatomatous masses. The attic of the right ear was also diseased. Temperature 104°, pulse 92, respiration 28. Lungs, heart, liver, spleen, and abdomen negative.

The pupils were small and equal and reacted well. Ophthalmoscopically the optic discs appeared somewhat swollen, redder than usual, and the retinal veins dilated and tortuous.

Operation April 15. Nitrous oxide and ether anesthesia. Usual incision for the radical operation, with an additional cut 3 cm. in length at right angles posteriorly. Entire mastoid exposed. Cortex hard and apparently healthy. Interior of mastoid down to the apex diploic in structure and softened. The superoposterior wall of the external auditory canal had disappeared; the radical operation had

[1]Read at the meeting of the American Otological Society at Washington, May 12, 1903.

been performed by nature. The tympanic cavity was filled with granulations, the antrum packed with cholesteatomatous material. The sigmoid sinus was far forward, only 4 mm. from the external auditory canal, and surrounded by diploic cells. The emissary vein was likewise embedded in softened diploic bone structure. The sigmoid sinus and the emissary vein were laid bare. The upper knee of the sinus was covered with a thin grayish exudate, while its upper parts and the emissary vein presented the normal blue appearance. The cholesteatomatous masses were removed from the antrum and the granulations from the tympanic cavity. No ossicles and no tympanic membrane were found. The antrum, very large, size of a filbert, showed a perforation through its roof. The opening measured 1 cm. in diameter. The dura mater prolapsed into the antrum and was covered with hard granulation tissue. In the tympanic roof a small spot of discoloration was seen. The opening in the antral roof was enlarged by the removal of bone, including the discolored area in the tympanic roof. In the dura mater no other changes save those mentioned above were found and no pus was encountered in the cranial cavity. A small erosion was discovered in the bone over the horizontal semicircular canal.

At the termination of the operation, which lasted over one hour, the wound was irrigated with sterile saline solution, flushed with absolute alcohol, and dressed with iodoform gauze.

April 16: Temperature still 102°; pulse slow, 78-80.

April 17: Temperature 101°, pulse 60-70.

April 18: Temperature 101°, pulse 80. General condition much improved.

April 20: Temperature 98.6°. General condition good. Soft diet.

April 22: Vomited this morning. Severe frontal headache. Photophobia. Optic discs red and swollen. Wound looks well. Temperature 99° to 100.4°, pulse varying greatly in frequency—48 to 84.

April 24: Still complains of headache, but takes nourishment. No focal symptoms, no amnesic aphasia. Temperature 98.8° to 100.4°, pulse 54 to 76. No vomiting. Late in the evening of the 24th began to moan and said that his headache was unbearable. Ophthalmoscopic examination showed marked double optic neuritis (choked disc). Sensorium clear.

Operation April 25. Nitrous oxide and ether anesthesia. Wound curetted, irrigated, and treated with absolute alcohol. Incision 1½ inches long upward, exposing squama. Temporal ridge and portion of squama, tympanic and antral roofs completely removed. The exposed dura was thoroughly cleansed with absolute alcohol. Aspiration through under surface of brain in the region of the tympanic roof. The needle was carried one inch upward and one syringeful of thick pus was obtained. Crucial incision through dura mater and under surface of brain. Evacuation of about two ounces of thick yellow pus. Finger introduced into brain; limiting membrane

felt. No irrigation of brain abscess. Drainage by narrow selvaged strips of iodoform gauze. Wet dressing. During the operation the pulse rose from 64 to 100.

April 26: Marked amnesic aphasia, which did not exist before the operation. The patient could not name objects shown to him, but described their use in fluent language. Temperature 101.2°, pulse 60. Slight headache. Pupils equal. No taches. No rigidity of neck. Reflexes normal.

At the dressing of the wound the withdrawal of the gauze was followed first by a discharge of pus and then by a flow of a considerable quantity of clear watery fluid. After the dressing the pulse rose from 60 to 88. The symptom of aphasia was less apparent, the patient naming several objects, but tiring after a few questions. Choked disc still pronounced on both sides.

April 27: Temperature 99.4°, pulse 86. General condition improved. Aphasia less marked; patient could name several objects. At the dressing pus and watery fluid evacuated from brain abscess.

April 28: Temperature 99.2°, pulse 96. Patient felt well. Ate with good appetite. No aphasia. No retention. Left pupil larger than right. Choked disc still present.

The patient made a rapid recovery and was presented at the May meeting of the New York Otological Society.

A CASE OF ABSCESS OF THE RIGHT CEREBELLAR HEMISPHERE WITH CARIES OF THE LEFT MASTOID PROCESS.

By E. Gruening, M.D.,
OPHTHALMIC AND AURAL SURGEON.

The case here described illustrates a difficulty encountered in the localization of an otitic brain abscess. Retardation of the pulse rate, drowsiness, vomiting, and rapidly developed optic neuritis were the symptoms pointing to the presence of cerebral abscess. As both ears were affected, the question arose as to whether the abscess was situated in the right or left side of the brain. At the time of admission the right ear was in a state of acute inflammation, which rapidly subsided after paracentesis of the drum. The left ear was more seriously affected. The mastoid cells were filled with pus and broken-down bone tissue, and one of the ossicles, the incus, was carious. For this reason the left temporo-sphenoidal lobe and the left cerebellar hemisphere were exposed and freely aspirated. The result of the operative exploration was negative. At the postmortem examination a large abscess was found in the right cerebellar hemisphere.

B. S., a school-girl, 10 years of age, was admitted to the Mount Sinai Hospital on April 3, 1903.

Past History.—In early infancy had measles, scarlet fever, and diphtheria, but no ear complications after these diseases.

Present Illness.—Acute onset ten days ago with pain on left side of the head, which still persists. Five days ago had chills and fever, severe headache, and purulent discharge from left ear. Child has been drowsy since onset and has been vomiting nourishment for the past three days.

Left Ear.—Drumhead red and swollen. Small perforation in lower anterior quadrant. No discharge. Over the region of the

mastoid the skin is red and swollen and pits on pressure. No fluctuation. Tenderness over pit, antrum, and behind the mastoid.

Right Ear.—Drum is red and swollen. No perforation.

Mastoid.—Slight tenderness over tip and antrum.

General condition fair. Well nourished. Answers questions readily, but relapses into drowsiness when not spoken to. Tongue dry, heavily coated. Pupils of equal size, react well. Ophthalmoscopic examination negative. Lungs, heart, liver, spleen, and abdomen negative. Temperature 102.8°, pulse 108, respiration 28. Several hours after admission, temperature 104.8°.

Operation.—Osteotomy for mastoiditis (left). Nitrous oxide and ether anesthesia. Bilateral paracentesis of drum. Usual curvilinear incision over mastoid. Periosteum easily lifted. Cortex hard. Mastoid cells and antrum contain granulation tissue and pus. Thorough curettage. Sigmoid sinus exposed. It appears normal. Thorough irrigation. Dry iodoform packing. Dry dressing. Time, forty-five minutes.

April 4: Patient much improved. Temperature 101°, pulse 104, respiration 24. Profuse seropurulent discharge from right ear.

April 5: General condition good. Drowsiness has disappeared. Temperature 100.4°, pulse 98, respiration 24. Diminished mastoid tenderness on right side. Discharge from right ear still profuse.

April 7: Wet dressing to mastoid wound. Temperature 99°. Slight discharge from right ear. No mastoid tenderness.

April 10: No discharge from right ear. Mastoid wound granulating. Out of bed.

April 16: Temperature 99.4°, pulse 88, respiration 24. Wound healthy. Dry dressing.

April 20: Patient vomited. Temperature normal. Right ear does not discharge. No tenderness of right mastoid. Ophthalmoscopic examination negative.

April 21: Vomited repeatedly. Right pupil larger than left. Ophthalmoscopic examination negative. Temperature normal.

Operation.—Cleaning out of middle ear. Exposure of dura. Multiple exploratory puncture of brain with aspiration. Nitrous oxide and ether narcosis. Incision extended upward and forward. Superior and posterior walls of external auditory canal, the drumhead, the ossicles, the antral and tympanic roofs, the temporal ridge, and a part of the squama were removed. Incus carious. The malleus found. The dura was normal in appearance. Intracranial pressure not markedly increased. The aspirating needle was introduced into the temporo-sphenoidal lobe in all possible directions. No pus was found. Wound irrigated with alcohol and dressed dry.

April 22: General condition improved. No headache. Pupils equal. Temperature normal.

April 25: Temperature normal. Appetite good. Slight drowsiness.

April 26: Temperature normal. Wound covered with healthy granulations. Vomited at 4 in the afternoon and again at 8. Pulse retarded, 60-68. No headache. No aphasia.

April 27: Temperature normal. Pulse 64. No headache. Slight drowsiness. Ophthalmoscopic examination negative.

April 28: Pulse 66. Frontal headache. Drowsiness.

April 29: Continues to be drowsy. Vomited more. Pulse 60-70. Refuses food. Right pupil larger than left. No aphasia. No pupillitis.

April 30: *Operation.*—Exploratory puncture of left temporo-sphenoidal lobe and left cerebellar hemisphere. Anesthesia by nitrous oxide and ether. Wound curetted and flushed with alcohol. Upper knee of sigmoid sinus and lateral sinus laid bare. Removal of part of the parietal bone above the knee of the sigmoid sinus and part of the occipital bone below the lateral sinus, exposing a larger area of the temporo-sphenoidal lobe and of the cerebellar hemisphere. Numerous punctures and aspirations in all directions in temporo-sphenoidal lobe and cerebellum. Result negative.

May 1: No change in general condition. Remains drowsy. Pulse faster and irregular. Receives nutrient enemata.

May 2: No change.

May 3: Does not retain nutrient enema. General condition not changed.

May 4: Drowsy. Answers when aroused. Says she has no pain. Vomited.

May 5: More drowsy. Involuntary urination. Pupils equal and dilated. Ophthalmoscopic examination negative. General tonic convulsion lasting three minutes. Pupils widely dilated. Vomited after convulsion. Temperature 98.6°, pulse 50-60, respiration 16-18.

May 6: Child still can be roused, but with great difficulty. Double optic neuritis present. Examination of right ear. Perforation healed. Temperature 97.4°, pulse imperceptible, respiration 8.

May 7: Tonic convulsion following enema. After convulsion respiration very slow, three per minute. Pulse can be felt. Artificial respiration kept up two hours.

Operation without anesthesia. Multiple aspirations of left temporo-sphenoidal lobe and left cerebellar hemisphere, with negative result. Artificial respiration kept up during operation. Child died at 5.35 P.M. Wound inspection and partial autopsy allowed.

Report of the Pathologist.—Left mastoid region: Site of recent operation found clean. Granulations beginning to form. Dura mater, as far as could be seen, appeared normal. Cerebrum normal on surface and in sections. Recent aspirations in all directions negative.

Cerebellum, external inspection, negative on palpation; no softened spot or bulging. Vermiform process negative.

On section left hemisphere shows sites of recent aspirations. No hemorrhage or abscess. Right hemisphere: Near upper surface of lobus Clivi, and extending forward and backward, an abscess cavity the size of a walnut, filled with grayish-red pus. No odor. Surrounded by a pyogenic membrane of the same color. The external layers of the membrane were fibrinous in character. The surrounding brain tissue is negative in appearance. Culture from abscess: Streptococcus.

In the hardened specimen the abscess cavity measured 3 cm. in the anteroposterior and 18 mm. in the transverse diameter. The limiting membrane has a thickness of 2.5 mm.

A CASE OF THROMBOSIS OF THE JUGULAR BULB: OPERATION; RECOVERY.

By Carl Koller, M.D.,
ADJUNCT OPHTHALMIC AND AURAL SURGEON.

Gertie S., 21 years old, was admitted to the hospital on June 30, 1902. For two weeks, immediately after an attack of tonsillitis, she has been suffering with pain in the left ear, general headache, and high fever, with chilly sensations. Four days ago paracentesis of the left drum was made in the dispensary—no pus. On admission some tenderness was found over the mastoid tip and antrum and over the posterior part of the mastoid. There is pronounced tenderness along the upper course of the jugular. Wryneck of moderate degree. The drum was not thickened, but of a pale greenish color, as if a green exudate adhered to it on the inner side. No discharge. The fundus of each eye showed marked venous congestion; on the next day this had so much progressed as to leave no doubt about a developing papillitis.

Operation on July 1.—Preliminary paracentesis. Considerable serous discharge. After the first removal of bone a minute quantity of pus was found. Sinus was accidentally opened, its wall being extremely thin. It was situated very superficially and well forward, overlapping the antrum. It bled freely. It was exposed for about one inch; it was blue in color, narrow, and bulged considerably. Some granulations were found in the antrum and the posterior cells; the cells of the tip were free of pus and granulations. Iodoform-gauze dressing. The subsequent course, after a short intermission, was septic in character. Patient complained of severe headache on the left side and occiput and extreme tenderness in the upper course of the jugular. Papillitis increased visibly, so as to deserve the name of a choked disc. Blood culture sterile.

Operation on July 11.—(1) Curettage of sigmoid sinus. (2) Ligature and excision of the jugular. The dura mater of the middle fossa was exposed over the tegmen tympani and antri; it did not bulge and appeared normal. Then the sinus was exposed in its entire length, going as near as possible toward the bulb. It was thrombosed. Upon curetting it bled freely from above, but the bleeding from the region of the bulb was not satisfactory. Then the jugular was tied and dissected as high up as possible; about one and one-half

inches of it were excised. It was not thrombosed. A culture of the thrombus found in the sinus was sterile.

Temperature in the next days ranged somewhat over 102°. Some tenderness was present over the wound in the neck and in the upper part of the posterior cervical triangle. On July 14 the patient complained of severe pain in head and pain on swallowing. The general condition was not good, patient being weaker and paler. On July 16 gauze packing from sinus was removed, and from its lower end some pus escaped with distinct pulsation. A rubber tissue drain was introduced toward the bulb and kept in that position. From now on until July 27 the temperatures were almost normal, there was no pain, and the general condition was very good. On July 27 the temperature rose again, and from now on kept intermittent; patient began to complain again of severe headache. No pus came from the sinus from the direction of the bulb. A tender, diffuse swelling appeared in the upper third of the posterior cervical triangle. A communication existed between this swelling and the jugular bulb, for, on pressing upon the swelling, pus escaped from the lower part of the sinus.

On August 4 a deep abscess situated between the deeper muscles of the neck and near the base of the occiput was opened and drained. With the probe one could feel a spot of the occipital bone near the condylus denuded. However, fever and pain continued. The presence of another abscess near the bulb of the jugular was decided on, and on August 14 this second abscess was searched for and found at a very great depth. It was reached from behind, after trying in vain to reach the stump of the jugular from the old wound in the neck. On August 16, two days after this last operation, it was noticed that the tongue when protruded deviated to the left. On the next day the complete symptoms of hypoglossal paralysis were present on the left side. Besides patient complained of difficulty in swallowing. When the sense of taste was examined it was found diminished in the posterior third of the left side. Temperature remained high. The discharge of pus was very profuse for a few days; then it stopped almost suddenly about one week after the last operation. Temperature became and remained normal and patient made a quick recovery. The papillitis cleared up gradually however, it took many weeks to disappear. The hypoglossal paralysis improved more slowly still, and traces of both could be recognized for several months.

This case, which presents a number of interesting features, differs in many particulars from the typical picture of thrombophlebitis of the sigmoid sinus. Its different phases are most easily explained when we assume that it was a case of primary phlebitis of the jugular bulb. This class of cases has been lately brought into prominence by Jansen and others. Whereas in cases of chronic ear

suppuration and mastoid disease the sinus is affected by way of the antrum or the posterior cells, and whereas in such cases we find a perisinuous abscess and secondarily phlebitis and thrombosis of the sigmoid sinus, the mechanism of infection must be a different one in acute cases where phlebitis supervenes but no mastoid disease has had time to develop. This mechanism is not quite apparent as yet, but the shortest route would suggest itself as the most likely, and that would be directly from the tympanic cavity to the bulb of the jugular, which lies in such close proximity. Perhaps congenital peculiarities would predispose an individual to this danger. If we look at our case from this viewpoint its course is easily intelligible. After suffering for two weeks from an acute otitis, the patient presented unmistakable signs of thrombophlebitis in the region of the left jugular—high fever with chilly sensations; severe headache; sensitiveness to pressure over the course of the sigmoid sinus, but especially over the upper course of the jugular in the neck. She also exhibited rapidly developing papillitis, which does not belong to the typical symptoms of thrombosis of the sigmoid sinus, although it is regularly met with in thrombosis of the cavernous sinus. But, according to Jansen's statements, papillitis is a common occurrence in the cases of primary phlebitis of the jugular bulb. The conditions revealed by the first operation agree fully with that view taken of the case. There were only slight evidences of an affection of the mastoid; no perisinuous abscess; the sinus, of healthy appearance, was not thrombosed, although there may have been a lateral thrombus. The operation brought no relief. At the second operation the sigmoid sinus was found thrombosed in its entire length. This may have been due to the packing at the time of the first operation, but may also have been an extension upward of a thrombus in the jugular bulb. It is certain that curettage toward the bulb did not produce satisfactory bleeding, and that after the operation the symptoms continued until the first dressing, when pus escaped from the lower part of the sinus groove, thus establishing evidence of the existence of an abscess in the bulb. Then relief came and continued for some time, during which the lowest part of the sinus discharged freely. When this free drainage ceased, a swelling in the neck appeared below the occiput, which communicated with the intravenous abscess; for when this swelling was pressed upon, pus oozed from the lower part of the sinus groove. The abscess in the bulb must have perforated and burrowed under the deep muscles of the neck, until

it appeared in the upper part of the posterior cervical triangle. Macewen gives another explanation of these deep abscesses. He states that they owe their origin to phlebitis of the condyloid emissary veins. Whatever the cause was, recovery could not ensue before the second abscess, which was still deeper and which was evidently the original periphlebitic abscess, had been opened and drained.

There are a number of unusual symptoms connected with the case, of which occasional mention is made in literature. Wryneck is sometimes found in cases of thrombosis of the jugular, and the explanation given by Koerner and others is that, the movements of the head toward the other side being painful, the head is instinctively held in wryneck position to ward off pain. It is hard to understand why this symptom should occur only in a comparatively small number of these cases. At different times in the history of our case we found for a few days difficulty in swallowing. After the last operation the symptoms of disturbed sensation of taste and motility of the tongue made their appearance, proving paralysis of the glossopharyngeus and hypoglossal nerves on the left side. It is not impossible that this may have been due to injury, although I feel pretty sure that such was not the case. Considering that the function of all the three nerves, the ninth, tenth, and the eleventh, leaving the skull through the foramen lacerum in close proximity to the jugular bulb, was disturbed, and that the twelfth, leaving through the condyloid foramen, was paralyzed, it may not be too far-fetched to assume that the periphlebitic abscess was responsible for it, just in the same way as we sometimes see facial paralysis in cases of mastoiditis.

[*Contributions from the Pathological Department—F. S. Mandlebaum, M.D., Pathologist.*]

ON CERTAIN FEATURES OF THE GROWTH OF BACTERIA ON MEDIA CONTAINING SUGARS AND SERUM; WITH REMARKS UPON THE ACID PRODUCTION.[1]

By E. Libman, M.D.,

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In the *New York Medical Record* for May 19, 1900, and in the *Centralblatt für Bakteriologie*, vol. xxviii., Nos. 10 and 11, I published a short communication based upon the observation of certain features of the growth of bacteria on media containing sugars and serum. The main fact developed at that time was that many bacteria can throw down a proteid precipitate from human blood serum in the presence of glucose, this being due to the acid production. Many bacteria were also found to precipitate ordinary egg albumen. The amount of glucose used varied from 0.1 per cent. to 0.5 per cent., and precipitation could be observed with other sugars. On solid media this precipitation took the form of a diffuse whitening of the media. The saprophytic bacteria examined at that time did not possess the property.

In the following paper I shall use the terms "whitening" and "precipitation" interchangeably, although it will be noted later that the whitening of solid media sometimes occurs without there being necessarily precipitation in the corresponding fluid media, and *vice versa*.

Since the publication of the preliminary notices I have found a number of other interesting and important facts bearing upon this question. On the present occasion I can only hope to give an abstract of some of my investigations. I shall discuss the question under the following heads:

1. The whitening of agar media and the precipitation in bouillon media containing sugars and serum.

[1]Reprinted from the Journal of Medical Research, vol. viii., No. 1, 1902.

2. The explanation of the phenomena.
3. Observations on gelatin media.
4. Observations on media containing blood; and some special phenomena which were occasionally seen.
5. Reactions at which precipitation can occur.
6. The use of sugar-serum media; and, finally,
7. Some general observations regarding the acid production.

I. THE WHITENING OF AGAR MEDIA AND THE PRECIPITATION IN BOUILLON MEDIA CONTAINING SUGARS AND SERUM.

To obtain a general idea of the precipitating powers possessed by various bacteria when grown on various sugar media, the following bacteria were tested on a large number of media; saccharomyces albus, bacterium megatherium, bacillus acidi lactici, bacillus prodigiosus, micrococcus candicans, staphylococcus aureus and albus, bacillus coli communis, meningococcus,[1] micrococcus gonorrheæ, bacillus mesentericus fuscus, bacillus pestis (obtained from Dr. Park), streptococcus, bacillus proteus vulgaris, bacillus diphtheriæ, bacillus anthracis, bacillus mallei, pneumococcus, vibrio cholerae, and a hog-cholera bacillus (obtained from Dr. Lartigau). Of some of these, only one variety was tested; of others, a large number.

The media which we used were made up of agar to which various sugars and sera were added, and also of bouillon media prepared in the same way, and of glucose-agar to which a solution of egg albumen had been added. The sugar percentages for the glucose media varied from 0.1 per cent. to 2.0; the other sugars, that is, lactose, maltose, and saccharose, were tested in strengths of 0.5 per cent. and 2.0 per cent. The 0.1 per cent. glucose was used as a matter of interest, because that is the amount generally considered to be present in the normal blood. The 0.5 per cent. was used because, as Theobald Smith has shown, it represents the most favorable percentage for the growth of most bacteria, and because it is the amount which is often present in the blood in diabetics. The higher percentages of the sugars gave the larger number of positive results.

There were used human sera (ascitic and hydrocele), cow's and sheep's sera. Although results can be obtained by adding a very small amount of serum, we, as a rule, added one-sixth to one-quarter.

[1]All the meningococcus cultures corresponded accurately to Weichselbaum's description.

The tubes were all observed five days: as a rule, if whitening or precipitation did not occur within two days it did not appear. In some, results could be noticed within a few hours. The tubes were kept at 37° C. Whitening can also frequently be observed at room temperature. No notes were made of the variable intensity of the reaction, but slight results were noted as such.

In the tests, the results of which are soon to be stated, ascites serum was used unless otherwise stated. When a negative result was obtained the experiment was repeated with hydrocele serum or with one-quarter ascitic fluid if one-sixth had been used. Cow's and sheep's sera often give a precipitate when human blood serum does not. Our analyses showed that such sera contained sugar in larger amount than the human sera we were using. They were also richer in albumin, and it was noted that precipitates could be obtained more readily the more albuminous a serum was. The egg-albumen medium was made by adding one-quarter of a 25 per cent. solution of egg albumen in water to 2 per cent. glucose-agar. As a rule Witte's peptone was used in making up the media; when slight results were obtained in the way of whitening, the experiments were repeated, using media made up with Merck's peptone. The results, however, remained the same. This precaution was taken because whitening can sometimes be seen on ordinary sugar-agar media made up with Witte's peptone—a subject to be discussed in a later paper. It was noted that some bacteria, whose colonies on agar do not whiten the medium, may whiten the medium when they grow in the condensation fluid. No note is specially made of this variation in the phenomenon.

Although all the experiments were made with great care and in duplicate, I do not claim that the results show exactly what all or any of the bacteria will always do in these media, as a bacterium which fails to precipitate in the presence of a certain sugar may very well be found to precipitate when a more active variety of the same organism is tested, provided the organism can split up that sugar. I believe, however, that I can draw some general inferences as to the occurrence of the precipitation, and as to its variation according to the amount and variety of sugars present.

The cultures used were for the most part obtained in routine hospital investigations. I am indebted to Dr. Hiss, of the College of Physicians and Surgeons, for many cultures, and to Drs. Lartigau and Park for numerous cultures and many other favors.

Inferences from Experiments.

Nearly all of the bacteria which were tested whitened the 2 per cent. glucose-agar medium, the exceptions being the bacillus mesentericus fuscus, the micrococcus candicans, and the bacillus mallei. Anaerobically most of the bacteria also whitened the 2 per cent. glucose medium. In the egg-albumen medium precipitation was found to occur with all the bacteria that precipitate in the 2.0 per cent. glucose-serum-agar, except the bacterium megatherium, the meningococcus, two varieties of bacillus proteus vulgaris, the bacillus anthracis, and the vibrio cholerae. As a rule the growth was less active on this medium than on the corresponding serum medium, but often more active than on ordinary glucose-agar. In the bouillon media it is often difficult to tell whether the precipitate is present or not, if it be slight in amount.

To convince one's self that a precipitate has been formed, it is wise to add an alkali and see if what looks like a precipitate can be dissolved out. Official potassium hydrate does not dissolve the bacteria and does dissolve the precipitate. It was therefore generally used for this purpose, so as to avoid the dilution incident to adding weak alkalies. It was found that many bacteria can throw down a decided precipitate in the bouillon media, and that positive results were much more frequently present with cow's serum than with human serum. The results on agar media containing 1.0 per cent. of glucose were almost the same as those for the 2.0 per cent. medium, except that the following bacteria failed to whiten this medium: meningococcus, bacillus pyocyaneus, bacillus pneumoniæ, and the bacillus anthracis. On the 0.5 per cent. glucose-agar medium, precipitation was to be seen with saccharomyces albus, bacillus prodigiosus, micrococcus candicans, staphylococcus aureus, meningococcus, gonococcus, bacillus pneumoniæ, bacillus mesentericus fuscus, bacillus proteus vulgaris, bacillus anthracis, and the bacillus coli communis. On the 0.1 per cent. glucose-agar medium positive results were obtained only with streptococci, the plague bacillus, some varieties of typhoid bacilli, and with the vibrio cholerae. Many of the bacteria that precipitate on glucose media did not precipitate in the presence of other sugars. Some that whitened lactose, saccharose, and maltose media of 2.0 per cent. strength did not whiten those of 0.5 per cent. strength. No positive results were obtained on the 0.5 per cent. sugar media when they were absent on the 2.0 per cent. media. Bacteria which are

known not to make acids from certain sugars were found not to precipitate on media which contained only those sugars. As a rule, precipitation did not occur in the bouillon media when not present in the agar media. The agar media were found to be much more delicate for determining the absence or presence of the phenomena than the bouillon media.

Besides the systematic experiments from which the previous conclusions have been drawn, a very large number of other experiments have been made, mostly with the glucose media, and from the combined observations some general remarks may be made.

Some bacteria did not precipitate in the presence of any of the sugars or strengths of sugars used; such are the bacillus mesentericus fuscus, the micrococcus candicans, and the gonococcus. Staphylococci were found not to precipitate on the 0.1 per cent. glucose medium. The meningococcus never whitened the 0.5 per cent. glucose medium, occasionally whitened the 2.0 per cent. slightly. The bacillus pyocyaneus did not whiten 0.5 per cent. glucose media and grew white on the 2.0 per cent. glucose media made up with serum or egg albumen and whitened the medium. It is interesting to note that the plague bacillus can precipitate on all the glucose media and on the 2.0 per cent. maltose serum-agar. Streptococci were nearly always found to precipitate on all the strengths of glucose used, but often did not affect saccharose media. The streptococcus colonies usually precipitated readily; the only exception was an attenuated streptococcus isolated from the blood *intra vitam* from a case of erythema nodosum with joint manifestations, in Dr. Brill's service. This whitened the media only by means of the condensation fluid. Typhoid bacilli never affected the lactose media, but always precipitated in the presence of 2.0 per cent. glucose. The bacillus proteus vulgaris always precipitated in the presence of 2.0 per cent. glucose. The bacillus of glanders (two varieties) affected none of the media. The bacillus diphtheriæ (five varieties), the bacillus of anthrax (three varieties) did not affect the 0.1 per cent. glucose medium. The bacillus coli communis also precipitated in the presence of 0.5 per cent., 1.0 per cent., and 2.0 per cent glucose, but varied in the other media. Pneumococci do not generally precipitate the 0.5 per cent. media, except one variety obtained from Dr. Park, which had been carried through a large number of animals. The pathogenic bacteria more frequently precipitate on the media containing low sugar percentages than the saprophytes.

II. EXPLANATION OF THE PHENOMENA

Tests were made which proved that the precipitation is independent of the variety of peptone used. The results were identical in media made up with meat infusion and meat extract. Precipitation occurred even if no salt were added to the media, although less frequently. Whitening could be produced on media made up of agar plus glucose and egg albumen or serum; in fluid media precipitation could be obtained when only serum and glucose were present. Results could not be obtained in tubes containing only egg albumen and glucose, as there was no growth. These experiments made it appear probable that the precipitation was due to the action of acids split off from the sugars, in the proteid present. This theory was amply confirmed by the following facts:

1. Precipitation in a bouillon medium or whitening in an agar medium was never found to occur without acid production.

2. If the organism precipitated in the presence of a high percentage of sugar and not a lower, it was found to make less acid in the latter. The presence of peptonizing power seems to interfere with precipitation, at times, in the media containing smaller sugar percentages. This is made especially probable by some observations on the symbiosis of certain streptococci and the bacillus mesentericus fuscus. For, if, in a tube which is being whitened by a streptococcus, the bacillus is inoculated before the tube becomes too acid to allow the bacillus to grow, the precipitate formed can be dissolved. This is not due, as might be suspected, to alkali production, as our figures show that the bacillus makes acid, although in small amounts, on glucose media.[2]

3. When bacteria whitened media aerobically and not anaerobically, they were found to produce less acid anaerobically.

4. When cultures in sugar bouillons of various strengths were added to diluted sera or white of egg, a precipitate soluble in alkalies was often obtained. By adding alkalies to such cultures they could no longer precipitate sera when the acidity had been reduced to a certain figure. This figure was reached sooner when stronger solutions of alkalies were used. This was not due to dilution, as the cultures could be diluted so as to reach a very low acidity and still possess the power of precipitating. The point at which such cultures no

[2]Peptonization and precipitation can, however, be observed together.

longer would precipitate seemed to be about the same for all the bacteria when added to a given serum. Filtrates of cultures gave the same results. Boiled cultures or boiled filtrates did likewise, although the results were less marked. Recently an ascitic serum was used in which a coagulum could be produced by the filtrates of cultures in glucose-bouillon. The filtrates of the growths of the same organisms in ordinary bouillon failed to produce a similar coagulum.

This serum was obtained from a case of multiple venous thrombosis apparently of infectious origin. (Service of Dr. Manges.)[3]

5. Occasionally a filtrate of a certain acidity, which would not produce a precipitate in a certain serum, could be made to do so by adding a small amount of one of the dilute mineral acids. The added amount of acid was too small to have itself produced any precipitate.

Chemical examinations made by Dr. S. Bookman (of the Pathological Institute of the New York State Hospital) of a precipitate produced by adding the filtrates of cultures of streptococci in sugar-bouillon to cow serum or egg albumen showed that the precipitate was a proteid and belonged to the group of the acid albumins.

Dr. Bookman in a personal communication, and later Dr. Levien at the May meeting of the Pathological Society, suggested that the precipitation might have been due to the presence of nucleic acid in the cultures acting in the presence of an acid medium. I append here a part of Dr. Bookman's report:

"The precipitates produced from cow serum (diluted with three parts water) and from 25 per cent. solution of egg albumen (white of egg) seem to be identical.

"The precipitate produced from the egg albumen contains 14.156 per cent. nitrogen; that from cow serum 14.168 per cent. nitrogen.

"The phosphorus contents were exceedingly low, being about 0.1 per cent., which precluded the precipitate from being a phosphorus-rich nuclein or nucleic or paranucleic acid, the phosphorus contents of which vary from 9.0 per cent. to 11.0 per cent. The dried precipitate is soluble in centinormal or 0.04 per cent. sodium hydrate. It gives a weak but distinct biuret reaction, and other properties point to classing it among the group of acid albumins. On account of the small yield further researches have been impossbile. I hope, however,

[3]Since writing the above I have had a number of samples of serum in which, when added to glucose-bouillon, coagula could be produced by the growth of organisms. They could also be produced by adding filtrates (sugar-bouillon cultures) to the pure sera.

in the near future to give its total percentage composition as well as description of its other properties."

It was attempted during part of this work to obtain precipitates free from bacteria, and in the course of these endeavors certain varieties of superimposed media were used, to one of which I wish to call your attention, simply because of its interest. If, over a stratum of agar to which egg albumen or serum has been added, a layer of ordinary glucose-agar is added and a stick or surface inoculation made on the latter, the lower layer can often be whitened, leaving the upper layer clear. The point of solubility of the whitening in the tubes I have not absolutely established, but, as a rule, one-quarter decinormal sodium hydrate will suffice to dissolve them out.

III. GELATIN MEDIA.

These experiments were carried out on a small scale with a 2.0 per cent. glucose-gelatin to which one-quarter of serum had been added. A number of facts were developed which can only be summarized now. Whitening was produced by a number of bacteria: many bacteria grew more rapidly and reached a final more voluminous growth on this medium than on gelatin or 2.0 per cent. glucose-gelatin. Some bacteria that liquefied ordinary gelatin would not liquefy this medium, but the same is also true of glucose-gelatin media. The pigments produced by the bacteria vary as to their occurrence, some being absent on this medium and present on ordinary gelatin, and *vice versa*.

IV. BLOOD MEDIA.

On plates made with glucose-serum-agar for purposes of bacteriological examination of the blood, a few interesting observations were made. Around many of the colonies there was found a dark halo. It was made evident by using plates made with less blood that the dark area was often due to precipitation only, although in some flasks of glucose-bouillon to which blood had been added there often ensued a diffuse darkening of the medium, which would go to show that there had been a change in the hemoglobin, due probably to the acid production. The clear spaces developed around some colonies (*e.g.*, staphylococci) on the blood plates have been noted by other observers and need not detain us here.

V. REACTIONS AT WHICH PRECIPITATION CAN OCCUR.

The limits of the acidity and alkalinity at which precipitation can occur were not absolutely determined, but on agar media precipitation could be obtained on media the titre of which varied from 1.8 per cent. acid (1.8 c.c. of decinormal sodium hydrate necessary to neutralize 10 c.c. of the medium) to 1.0 per cent. alkaline (on adding the serum such media became 1.6 per cent. acid to 0.4 per cent. alkaline). In bouillon media precipitation was found in media ranging from 2.6 per cent. acid to 2.0 per cent. alkaline (on adding the sera such media were 2.3 per cent. acid to 0.3 per cent. alkaline). These titrations were made according to the formula of the American Public Health Association. If they were made according to the more common method of titrating for determining acid production (*i.e.*, adding alkali until the first change in color occurs) the acidity would amount to about 0.3 per cent. to 0.5 per cent. less.

A point of decided interest noted was that whereas the growth was greatest in bouillon media of which the titre was 1.0 per cent. acid when no sugar was used, it was best in a medium 0.2 per cent. alkaline when sugar was present.

VI. USE OF SUGAR-SERUM MEDIA.

On these media, particularly on the one containing 0.5 per cent. glucose, the growth of most bacteria is much more marked and more rapid than on ordinary serum-agar. This is particularly true of the streptococcus, pneumococcus, gonococcus, and the meningococcus.

I wish to draw especial attention to the value of adding glucose to the serum-agar ordinarily used for cultivating the gonococcus, for by means of this addition I could obtain colonies from urethral discharges when absent on ordinary serum-agar, or if present in the latter they were often smaller. As a rule we have used a mixture of two parts of 0.5 per cent. glucose-agar and one part of human serum (hydrocele fluid preferably). Even the addition of 0.1 per cent. glucose seems to favor the development of the gonococcus.

I would recommend the media particularly on account of the rapidity of growth upon them. This is especially true in making cultures from the blood. I have made some use of these media for

saving time in plate work. The principle involved is that we should use the medium which contains a sugar which does not allow of precipitation by a certain bacterium. Thus, for finding the bacillus typhosus I use a medium consisting of 0.5 per cent. (sometimes 2.0 per cent.) lactose-serum-agar. On such a plate the bacteria which precipitate are surrounded by a white halo. According to our observations thus far, the typhoid bacillus does not precipitate in the presence of lactose; therefore colonies on the plate with a distinct halo can at once be excluded as not being those of the typhoid bacillus, and only the others need to be investigated. I believe this method can be developed by further study. I must draw attention, however, to one drawback, which, however, thus far has not been a serious one. If there are numerous colonies on the plate the entire plate becomes opaque white. If this drawback should be proved to be often a serious one, it might nevertheless be advisable to use the method, for the growth is so much more rapid on these media that when the plating is successful the reports can be made quite early. I have used the media to a great extent for revivifying old cultures on ordinary media. The meningococcus, for instance, can be kept alive practically indefinitely if transplanted on to serum-glucose-agar for one day and then back on serum-agar, etc. Bacteria which are inoculated on these media for this purpose should be transplanted after twenty-four to forty-eight hours, as many of them are not long-lived on these media. I believe we will be able to make use of the media to a certain extent for the differentiation of bacteria and species of bacteria, but more extended observations are needed before any rules can be made.

VII. REMARKS ON THE ACID PRODUCTION.

This work seems to bring into greater prominence the acids produced by bacteria. It has been occasionally stated that in infections of various kinds there exists an acid intoxication. This has usually been traced, however, to disturbances of cell metabolism such as occur in diabetic coma and cancerous cachexia; but an attempt should be made to determine what rôle may be played by the acids developed by bacteria. It is known that in the body the bacteria always have a sugar culture medium, and my figures (to be published later) show that appreciable amounts of acid can be formed in the presence of the amount of glucose which exists in diabetic or even in the normal

blood; moreover, in the body there will be a new supply of sugar as long as the circulation to a part invaded by bacteria is not cut off.

The acids generally produced by bacteria are the following[4]: The most important and most widely distributed is lactic acid; in traces formic, acetic, propionic, butyric, caproic, succinic, and valerianic. Rarely lactic acid is absent and the others present. I shall not now go into detail here as to the known effects of such acids. The question is, are they formed in the human body? In the intestinal canal it is known that some of them are formed. Theoretically we are led to believe that they can also be formed in the tissues, for Theobald Smith has shown that when sugars are present bacteria in their growth first split up such sugars and acid formation results. There is a small amount of proof that such acids are generated in the body. Frosch and Kolle[5] state that the staphylococcus aureus produces lactic acid and also isobutyric, valerianic, and propionic acids, and that these acids have been found by several investigators in the pus produced by this organism. These authors are inclined to believe that the acids play a rôle in suppuration.

From these remarks it is evident that we should endeavor to ascertain whether acids are not produced in infectious processes. Their effects upon the blood and their action in the gastrointestinal tract are well worthy of study. Some attention has been paid to the latter part of the subject. It is probable that they would play a greater rôle in diabetics than in non-diabetics, for in the former they could be generated in large amount. Is it not possible that some of the peculiarities of infections in diabetics, especially local infections, may be due in great part to them? Is it not possible that some of the facts developed in the course of our investigations may be of importance in explaining the features of certain forms of thrombosis, the explanation for the development of which has never been fully given? There are many facts which make such an occurrence very likely and there are others which might be considered to militate against it. I cannot at the present time go into any further discussion of the subject, but I believe the question should be brought up so as to indicate in what direction this line of work should be further continued. In one of his classic papers on acid production Theobald Smith says: "It is probable that the presence of a small amount of

[4]Lehmann and Neumann: Atlas de Bakteriologie: 1896: Bd. ii.
[5]Flügge, Die Micro-crganismen, 1896, vol. ii., p. 189.

fermentable carbohydrate in the intestinal canal and the body fluids may be of the greatest significance as regards the attack on the body by, and the development in it of, pathogenic bacteria," "and," I might venture to add, "their mode of action."

[I wish to thank the members of the House Staff of the Mount Sinai Hospital for much valuable assistance. I am also indebted to Dr. Bookman for many kindnesses.]

[*Contributions from the Pathological Department—F. S. Mandlebaum, M.D., Pathologist.*]

ON THE BACTERIOLOGIC STUDY OF A CASE OF PARACOLON INFECTION PROBABLY SECONDARY TO TYPHOID FEVER,

WITH REMARKS ON SERUM REACTIONS IN PARACOLON INFECTIONS AND ON THE THREAD REACTION.*

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NOTES ON THE HISTORY OF THE SUBJECT.

The subject of infections by members of the group of organisms intermediate to the typhoid bacillus and the typical colon bacillus of Escherich—the so-called paracolon bacilli—is one of ever-increasing interest. The name "paracolon" was first applied to the group by Gilbert,[1] who described five types of paracolon bacilli. He found members of this group present in the intestinal canal of man and many animals.

The first important cases† of infection by such organisms were described by Achard and Bensaude[2] in 1896, under the title of "Paratyphoid Infections." Their cases were as follows:

Case I.—A case clinically resembling typhoid fever with an intercurrent relapse followed by a femoral phlebitis. During the course of the patient's illness the writers twice isolated from the urine, which had become purulent, a so-called paratyphoid bacillus which was identical with the one found in the second case. A blood culture made during the height of the fever proved negative. Aspiration of the spleen revealed staphylococci only. The stools contained only the usual forms of colon bacilli, typhoid bacilli being absent. The

*Read, March 28, 1902, at the Second Annual Meeting of the American Association of Pathologists and Bacteriologists, Cleveland, Ohio. Reprinted from the *Journal of Medical Research*, vol. viii., No. 1, 1902.

†In this summary of the cases we shall exclude the epidemics of meat poisoning and cases of psittacosis.

patient recovered after an illness lasting six weeks. During the course of the disease the authors obtained a positive serum reaction with the paratyphoid bacillus and with several cultures of typhoid bacilli, the reaction with the typhoid bacillus persisting for less than two months after defervescence.

The authors bring up the question whether or not the case was one of typhoid fever complicated by a pyelonephritis due to the paratyphoid bacillus, and cite a number of cases in which colon bacilli had been found in cases of cystitis and pyelonephritis complicating typhoid fever. They conclude that the illness was due to the paratyphoid bacillus alone, because the serum of animals which had been inoculated with their paratyphoid bacillus agglutinated not only the paratyphoid bacillus, but also some varieties of the typhoid bacillus. It is unnecessary to enter into any prolonged discussion of the subject, because, as Widal and Nobecourt[3] very properly remark, the serum reactions in this case are of no value, as the authors did not make use of any dilutions of the serum.

Case II.—The second case was that of a female infant aged seven months, who, after a febrile illness of almost three weeks' duration, beginning with a bronchitis, developed a suppuration of the right sternoclavicular joint. From the pus an organism was obtained resembling that found in the first case. Both organisms closely resembled the bacillus psittacosis. No other examinations were made in the case, and, as the authors state, typhoid fever could not be excluded. The description of these organisms will be detailed later in connection with the discussion of the bacillus isolated from our own case.

The next case to be reported was that of Widal and Nobecourt[3] in 1897. A phthisical patient, after being three weeks in the ward, developed an abscess in the neck near the esophagus, with slight constitutional symptoms. From the pus a paracolon bacillus was isolated. (This case is considered by some authors as if it were the sequela of an attack of typhoid fever, but the patient at the time of observation was 31 years old and the attack of typhoid fever occurred at the age of 9.)

Widal and Nobecourt state that they are opposed to the term "paratyphoid," because the organisms more closely resemble the colon bacillus than the typhoid bacillus. They cite some observations of Tavel and Lanz,[4] who found similar organisms in cases of peritonitis, and they mention a case of suppuration in the spleen due to a related organism.

In 1898 Gwyn[5] reported the case of a man who suffered from a typical attack of typhoid fever with intestinal hemorrhages. The Widal reaction was absent. Three and a half weeks after the onset of the disease Gwyn isolated from the blood a paracolon bacillus.

Malherbe and Mounier[6] isolated a paracolon bacillus from a case of inflammation of the penis with induration of the corpus cavernosum.

Cushing's[7] case is the most complete study among the various papers on the subject. The history was in brief the following:

A man 27 years of age suffered for ten weeks with an attack of fever described as typhoid. He had a relapse beginning with an epistaxis. During convalescence he developed two foci of costochondral osteomyelitis. One of the foci disappeared, but the other broke open six months later and discharged pus. Since that time he had a sinus at the level of the fifth rib at the edge of the sternum. From this focus, nine months after the onset of the fever, Cushing obtained the paracolon bacillus in pure culture. The Widal reaction was negative.

Cushing refers to the report of a case by Blumer[8] in which the latter stated that he found the bacterium coli in a post-typhoidal rib abscess. As the organism produced alkali in milk and therefore probably did not ferment lactose, Cushing believed that it was probably a member of the group of bacilli under discussion.

Schottmueller[9] in 1900 reported a case of fever lasting twelve days, beginning with reddening of the conjunctiva and the nasal mucous membrane. A roseola and enlarged spleen were present. The Widal reaction was absent. The blood culture made at the height of the attack yielded a "typhoid-like" bacillus. Later[10] he reported five cases occurring during a small epidemic of typhoid fever, in all of which the Widal reaction was absent and from the blood of each of which he succeeded in isolating "typhoid-like" bacilli. The clinical picture resembled typhoid fever. All of the patients recovered; there were no complications and no relapses. (So the author states; but his second case certainly must be looked upon as having had a slight relapse.)

The report of only one Widal reaction is made. The blood of each of the patients gave a positive reaction with the organism isolated from the case and with some of those isolated from the other cases, in high dilutions. The complete data will be given later. In the

sixth case he made the diagnosis on the basis of the serum reactions alone.

Kurth,[11] in a series of sixty-two cases of typhoid fever, found five which did not give a positive Widal reaction. From the urine of one case and the stools of another he isolated a bacillus probably belonging to the group under discussion, with which a positive reaction was obtained with the serum of four of the cases. The fifth was the case with the bacillus in the urine; no serum was obtained from this case.

Although it is not my purpose to enter into the description of the cases clinically in this paper, it is essential to refer to a few facts concerning the cases of Kurth and Schottmueller. In five of Schottmueller's seven cases the duration was respectively twelve days, nineteen days, seventeen days, sixteen days, and thirteen days. In one the onset was characterized by headache and sneezing; in three by reddening of the face, conjunctivæ, and the nasal mucous membrane. In four of the cases there was constipation; in one diarrhea. In one case the roseola developed by the fourth day. All of the cases ended by lysis.

Kurth's cases lasted respectively three weeks, fifteen days, twelve days, eighteen days, and two weeks. All had diarrhea. In one case the roseola was present on the sixth day and in one on the fifth day. In one case the temperature dropped by a distinct crisis.

These data are given to emphasize the mention of a paper published by Brill[12] in 1898 before Gwyn and Cushing reported their results. Brill reported a series of cases which, though they were usually considered instances of typhoid fever, he believed should be placed in a distinct group, and which he believed could be diagnosed by their clinical appearances and the absence of the Widal reaction during the duration of the fever and during convalescence. In none of Brill's cases could the typhoid bacillus be isolated from the feces; in one a variety of the colon bacillus was isolated from the blood aspirated from the spleen. (The cultural characteristics are not detailed.) Some of Schottmueller's and Kurth's cases resembled the clinical picture described by Brill.

Because of the absence of indican, acetone, and diacetic acid from the urine, Brill was not inclined to assume that the condition was due to a toxic agent produced in the intestinal canal; he suspected that the cases might be due to an infection by colon bacilli. The investigation of his own cases, as far as it went, did not seem to confirm this view sufficiently.

The last case to be reported was one presented by Buxton and Coleman[13] to the New York Pathological Society in February of this year. Clinically it resembled typhoid fever, and the paracolon bacillus was isolated from the blood. The Widal reaction was practically negative, but a reaction was present with the paracolon bacillus. All the cases thus far referred to recovered.

The clinical history of our case will not be given in full, because it is to be made the subject of a special article by Dr. Berg and the writer.[14]

HISTORY OF OUR CASE.

C. L., 33 years of age, admitted to the Mount Sinai Hospital on August 31, 1901. Previous history practically negative. Present history: Ten days ago the patient was suddenly taken ill with nausea, vomiting, and prostration. Temperature 100° by mouth. There was abdominal distension and pain in the epigastrium. He remained in bed only two days, but was too weak to return to his work. Three days before admission he was seized with severe colicky pain located in the epigastrium and right hypochondrium, vomiting and constipation; his skin was subicteric; temperature 103° F. On admission the liver was not found enlarged, but there were friction râles heard over it. Below the costal margin there was felt a very tender mass about the size of a large lemon. Spleen enlarged to percussion. No roseola present. Leucocytes, 15,000. Ehrlich reaction not present. On the day after admission Dr. Berg performed an exploratory laparotomy, suspecting either a cholecystitis or an abscess of the liver. The mass felt was found to be a Riedel lobe. The gall bladder was distended; its contents could not be expressed. There was fibrin over the liver. The gall bladder was aspirated and dark, thick bile obtained. After the operation the temperature varied between 103° and 106° F.; intense jaundice was established, with marked cerebral symptoms. Incessant vomiting developed on September 9, and the patient died on the following day. There was an agonal polymorphonuclear leucocytosis.

BACTERIOLOGIC EXAMINATION.

On September 1 the fluid aspiration from the gall bladder was plated, and a pure culture of an organism identical with that found later in the blood and urine was found. On the following day I made a blood culture to determine whether the presence of the bacilli in the gall bladder might not be due to an excretion of organisms from the blood. Eleven cubic centimetres of blood were used, part being plated and part being grown in fluid media. From both sources was obtained a pure growth of a paracolon organism.

On September 8 the urine was plated and a large number of colonies of the paracolon bacillus was found, with a few colonies of the staphylococcus albus.

On September 9, about twelve hours ante mortem, another blood culture was made, eleven cubic centimetres again being used. There were obtained numerous colonies of a paracolon organism and a few colonies of the staphylococcus albus and streptococci.

A few hours after the fatal termination a culture was made from the spleen. There were found colonies of the paracolon bacillus associated with the staphylococcus citreus and albus and streptococci. From the blood aspirated from the heart the same organisms were recovered as were found in the blood the day before death. (The staphylococcus albus and streptococci probably represent an agonal invasion.)

A culture of the contents of the ileum, made at the time of the postmortem examination, revealed two forms of colon bacilli (both of which coagulated milk and produced indol), the bacterium proteus vulgare, staphylococcus albus, and streptococci. There were no typhoid bacilli and no paracolon bacilli found. For all these investigations serum-glucose media were used.

DESCRIPTION OF THE PARACOLON BACILLUS.

(All media sugar-free, except when otherwise mentioned.)

Titre of media one per cent. acid (with phenolphthaleïn).

The organism is a facultative anaerobe.

Morphology.—The organism resembles the typhoid bacillus in morphology. In glucose-sugar, after twenty-four hours, it appears in larger forms, and after forty-eight hours shows some involution forms and vacuolization. After two days on potato it shows rather distinct bipolar staining. No capsules; no spores. It stains like the typhoid and colon bacillus, being decolorized by the Gram procedure. The organism is markedly motile in bouillon cultures at 35° C. and 37° C., and retains its motility for several days. Six to twelve long flagella are present, arranged in peritrichal fashion. In gelatin and agar, surface and stick cultures, and in glucose-agar (surface) it resembles the typhoid bacillus, but the growth is more profuse and whiter in color. Gelatin is not fluidified. Agar plates emit an odor resembling that of the colon bacillus. Macroscopically, the surface colonies are somewhat larger than those of the B. typhosus and whiter. Microscopically, the smaller colonies show a densely granular centre, the colony becoming less and less granular toward the periphery. The larger colonies have a brown, irregular nucleus

which is coarsely granular; the remainder of the colony is made up of heaps of granules which are browner near the centre and larger in the clearer area at the periphery. The margin of a colony is round or irregular. The deep colonies are brownish in color, oval or whetstone-shaped; irregularly-shaped knobs are often present.

Bouillon.—Diffusely clouded in twenty-four hours. Turbidity intermediate between the B. typhosus and B. coli; white, fine, powdery sediment. After forty-eight hours there is a marked fluffy deposit. There is no scum formed even after seventy-two hours. The cultures emit an odor like cultures of B. coli, but less marked.

Reaction with Carbohydrates.—(One-half per cent. sugars used.) Glucose is split up with the production of acid and visible gas. In glucose-bouillon one and five-tenths per cent. acid produced in six days. In fermentation tubes maximum gas produced in twenty-four hours, amounting to thirty-three one-hundredths per cent. (Einhorn tube). Maltose is split up with the production of acid and visible gas. Maximum acid one in twenty-five one-hundredths per cent.; maximum gas after two days, fifty one-hundredths per cent. Lactose and sucrose are not affected. In fermentation tubes there is no growth in the branch; in the bulb there is active growth with alkali production. Amount of alkali produced same as in ordinary bouillon, being one and five-tenths per cent. after one month.

Corresponding to its effect in the fluid media, the organism causes precipitation and gas production in two per cent. maltose and two per cent. glucose-serum-agar, but none in the corresponding lactose and sucrose media.[15]

Plain Milk in Tubes.—Unchanged for several days, then becomes yellowish and more and more translucent, the change being very marked after four weeks. The fat then floats on the surface and a white deposit is seen at the bottom of the tube. Boiling causes no coagulation.

Plain Milk in Fermentation Tubes.—In the branch a bubble of gas, otherwise unchanged. Bulb same as milk tubes.

Litmus Milk in Tubes.—After twenty-four hours distinct though slight acid reaction. After a few days (varying from three to six), reduction, and then quite marked progressively increasing alkali production. (Tubes often again show reduction at the bottom after three weeks.)

Litmus Milk in Fermentation Tubes.—After twenty-four hours bulb and branch slightly acid, bubble of gas in branch. After forty-

eight hours, reduction in branch; later marked alkali production in bulb; the branch becomes blank white in color. Milk is never coagulated.

Potato.—A slight white shining growth is the rule. On the same potato tubes the typhoid bacillus gives no visible growth. (Occasionally a moderate yellowish-green growth was obtained with our organism.)

Indol Reaction.—Positive but slight in peptone water and sugar-free broth, tested after eight days with sulphuric acid and one ten-thousandth sodium nitrite. In some tests made in peptone water with one-half of one per cent. sodium nitrite, a positive result was obtained with our paracolon bacillus after three days, with the colon bacillus in twenty-four hours, but was absent with the typhoid bacillus even after eight days.

PATHOGENESIS.

The organism was pathogenic for guinea-pigs and rabbits, producing peritonitis when inoculated intraperitoneally, and otherwise causing septicæmia with degeneration of the viscera and focal necroses in the liver.

PROTOCOL OF ANIMAL EXPERIMENTS.

(In all experiments twenty-four-hour bouillon cultures used.)

Guinea-pig 1.—One cubic centimetre of culture of bacillus from the blood, intraperitoneally. Death in sixteen hours. Seropurulent fluid in the abdomen; fresh fibrin on intestines and liver. Organism recovered from peritoneum and heart blood.

Guinea-pig 2.—One cubic centimetre of culture of bacillus found in second blood culture, intraperitoneally. Died after fifteen hours. The result as above.

Guinea-pig 3.—The same experiment with bacillus from gall bladder. Same result.

Guinea-pigs 4 and 5.—Same experiment with paracolon organisms obtained from the urine. Result practically the same.

Guinea-pig 6.—One cubic centimetre of culture of bacillus isolated from the blood, intraperitoneally. Death after eighteen hours. Cloudy serous exudate with fibrin in peritoneal cavity, a few hemorrhages in mesentery. Organism recovered. Liver shows parenchymatous degeneration.

In the succeeding experiments the organism used was the paracolon bacillus isolated in the first blood culture.

Guinea-pig 7.—One cubic centimetre subcutaneously. Death after

eight days. There was an indurated area at the site of injection, not extending to the muscles or peritoneum. The peritoneum was injected. There was a slight non-purulent exudate. The intestines showed marked injection. The liver showed focal necroses with infiltration by leucocytes. There were also small areas in which there was a collection of round cells and polynuclear leucocytes. In one of the portal vessels a bacterial thrombus was found. Lungs congested and contain small hemorrhagic areas. Spleen shows areas of suppuration; kidneys, parenchymatous degeneration and congestion. Organism recovered from indurated area and heart blood.

Guinea-pig 8.—Intraperitoneal inoculation with one-fourth cubic centimetre. Died after fifteen hours. Result same as with guinea-pigs 1 and 2.

Guinea-pig 9.—One-eighth cubic centimetre intraperitoneal inoculation. Died after thirty-six hours. Seropurulent peritonitis, moderate pericardial effusion. Liver, parenchymatous degeneration with hemorrhages under the capsule. Kidney, parenchymatous degeneration. Organism recovered from peritoneum, pericardium, and heart blood.

Rabbit 1.—Two cubic centimetres; intravenous. No result.

Rabbit 2.—Two cubic centimetres; intravenous. Death after sixty hours. Liver shows parenchymatous degeneration; also foci consisting of round cells and polynuclear cells located mainly around the portal vessels, hemorrhage under the capsule and focal necroses. Kidney, parenchymatous degeneration, occasional purulent focus. Organism recovered from heart blood.

NOTES ON THE POSTMORTEM EXAMINATION OF OUR CASE.

It was only with the greatest difficulty that permission for an autopsy was obtained. We were restricted to an examination through the incision in the right hypochondrium, which had not entirely healed. The examination was made twenty-one hours post mortem, and meanwhile the body had been embalmed, formalin being used. We were under the continuous surveillance of a relative. As a result we can give only an incomplete report. Enough material was obtained, however, to make a fairly satisfactory microscopic examination. The results of the macroscopic and microscopic examinations will be combined in this report. All the organs were bile-stained.

Lungs.—Fibrin over both upper lobes.

Heart.—(The changes in the valves which were found and which explained a murmur heard during life were apparently dependent upon a traumatism sustained in early childhood. They are irrelevant here. We hope to report on this aspect of the case at some other time.) Parenchymatous myocarditis; many of the nuclei are very large, and are irregular in shape; fragmentation of the muscle fibres.

Spleen.—Slightly enlarged (evidently was very large, but was shrunken by the preservative). Fibrin on the surface. Microscopically there are the changes of chronic interstitial splenitis and acute hyperplastic splenitis. The capsule is very thick; the trabeculæ and the walls of the arteries likewise. There is intense congestion of the pulp and marked pigmentation. There is also a marked proliferation of endothelioid cells, and a number of phagocytic cells, most of the latter containing pigment granules. The endothelium of the smaller vessels is markedly swollen. Scattered through the pulp are a number of large clumps of bacilli. Only at the margins of the clumps can individual bacilli be seen. The bacilli resemble the paracolon bacillus in morphology and are decolorized by the Gram procedure.

Liver.—Moderately enlarged; fibrin on surface. Microscopically there are present the lesions of advanced chronic congestion. The capsule is thickened. There is marked parenchymatous degeneration present, this being more marked near the centre of the lobules. About the branches of the portal vein there is a slight increase in the connective tissue, and an accumulation of lymphoid and epithelioid cells. The endothelium of the vessels is swollen, and an occasional phagocyte is present in the branches of the portal vein. The organ is markedly pigmented. The bile ducts show no changes.

Gall Bladder.—Wall shows no changes.

Pancreas.—Slight grade of interstitial pancreatitis; islands of Langerhans not involved. The intima of the arteries is thickened.

Kidneys.—Normal in size; capsules adherent. Microscopically there is marked congestion, parenchymatous degeneration and pigmentation. The arteries show marked thickening of the intima, and there are some areas of chronic interstitial changes. The cells lining Bowman's capsules are swollen and there is a marked hyperplasia of the cells covering the glomerular tufts. Some of the tubules contain casts.

Intestines.—On the surface of the coils of a small intestine were the slight remains of a fibrinous peritonitis. Only the lower ileum could be examined. Scattered throughout it are a number of depressed, pale, round or oval areas. These vary in size from those two by one centimetre to those three by four centimetres. They are thinner than the surrounding part of the intestine and are mostly oval in shape, the smaller diameter lying transversely.

These appear to be healed ulcers. This view is confirmed by finding several similar areas where the submucosa is still exposed in the centre of the areas.

Microscopical examination shows that the changes found are of recent date, for there are marked inflammatory changes present. Some of the Peyer's patches have evidently been partially ulcerated away, and are covered by a layer of tissue containing round and epithelioid

cells. The part of the patch remaining shows hyperplastic changes. Some of the lymphoid nodules are apparently normal. The areas which appear to have been the site of ulcerations are, for the most part, not covered by villi. Between the tubules, near the sites of the healed ulcers, there is a marked collection of lymphoid and epithelioid cells.

SERUM REACTIONS IN OUR CASE.

On August 31, September 1, and September 2 the Widal reaction was negative in a dilution of one to twenty.

September 3: Serum gave no Widal reaction. With the bacillus isolated from the gall bladder there was a thread reaction (see below) in a dilution of one to thirty. This appeared after three hours and was present after twenty-four hours. In a dilution of one to one hundred there were threads in three hours, followed by an agglutination reaction in twenty-four hours.

September 7: Serum from a typhoid case with typhoid bacilli one to two hundred; positive instantaneously. Serum from same typhoid case with the paracolon bacillus one to twenty; negative. Serum Ireland * + typhoid bacilli one to two hundred, positive; one to five hundred, negative. Serum Ireland + bacillus from blood, thread reaction one to one hundred; after twenty-four hours, some clumps. Serum Ireland + bacillus from gall bladder, one to twenty, threads; after twenty-four hours, bacteria, partially clumped, partially in threads.

September 8: Serum Ireland + bacillus from gall bladder one to twenty; a few threads after three hours; after twenty-four hours, negative. Serum Ireland with bacillus from blood one to fifty, thread reaction after three hours; persists after twenty-four hours. Serum Ireland with typhoid bacillus one to two hundred and fifty, positive. The serum of two cases of typhoid fever, two cases of appendicitis, and two cases of gall-bladder disease (the latter four being due to colon bacilli) gave no reaction with our organism.

September 9: Serum Ireland with typhoid bacilli one to two hundred, positive. Serum Ireland with bacillus from gall bladder one to twenty, as on September 8. Serum Ireland with bacillus from blood one to twenty and one to fifty, gave thread reaction in three hours; clumps after twenty-four hours. Serum from three cases of typhoid fever which reacted positively to the typhoid bacillus, gave no reaction in dilution of one to twenty with our organism.

September 10: Serum Ireland gave same results as before with the bacillus from the blood, the bacillus from the gall bladder, and the typhoid bacillus, but gave no reaction with two varieties of colon bacilli from the stools of another patient.

*Serum Ireland is serum from our case.

September 12: The serum gave a thread reaction in three to four hours, followed by partial or complete agglutination in a dilution of one to twenty with the bacilli isolated from the blood, urine, and the gall bladder. With the bacillus isolated from the second blood culture reaction was positive in a dilution of one to fifty. Serum Ireland gave no reaction with a colon bacillus from a case of appendicitis and one from a case of cholecystitis.

September 13: Serum gave a positive reaction in dilution of one to fifty with the bacillus isolated from the spleen post mortem, but gave absolutely no reaction with the colon bacilli isolated from the intestine.

September 16: Reactions were made in dilutions of one to twenty only. With all the paracolon bacilli isolated from the case there was a thread reaction after three to four hours, followed in twenty-four hours by an agglutination reaction, or by a reaction consisting partly of clumps and partly of threads. The serum gave no reaction with the bacilli isolated from the stools and reacted positively with the typhoid bacillus.

THE SUMMARY.

It will thus be seen that the patient's blood gave a specific reaction with both the typhoid bacillus and the bacillus isolated from the case. Further notes on these reactions will be given later.

On March 7, 1902, the serum still gave a positive reaction with the typhoid bacillus, but gave no reaction even in a dilution of one to five with the paracolon bacillus isolated from our case, the bacillus of Gwyn, the bacillus "O" of Cushing, two varieties ("Mueller" and "Seeman" of Schottmueller's bacilli, Buxton's bacillus, a paracolon bacillus isolated by Dr. Norris, and an organism of the hog-cholera group isolated by Dr. Lartigau.

RELATIONSHIP OF OUR ORGANISM TO OTHER SIMILAR ORGANISMS, WITH NOTES ON THE LATTER.

Because of the incomplete description given by some of the writers, it is difficult to group their bacilli accurately. Furthermore, variations in the media used by them interfere to a great extent in comparing the results.

Durham[16] originally placed in the "intermediate group" a number of organisms concerned in the etiology of meat poisoning. Later Cushing[7] studied the B. enteritidis, the B. morbificans bovis of Basenau, the B. Hatton of Durham, the B. choleræ suis, the B. icteroïdes of Sanarelli, and the B. typhi murium of Löffler. He finds that all

these organisms correspond in their main features, which are the following:

They are identical in morphology with the typhoid bacillus; are motile, having as many or more flagella than the typhoid bacillus; they are distinctly pathogenic for men and animals. In milk they produce no coagulation; they produce visible gas in glucose, but do not ferment lactose and sucrose; no indol is produced.* It is unnecessary to quote the amounts of the constituent gases produced in the fermentation of glucose. From a careful study of the bacillus "O" from his own case, and Gwyn's bacillus, Cushing believes that they could best be placed in a subdivision of the enteritidis group, as they are slower in their action in milk (alkali production) and grow less luxuriantly, resembling the typhoid bacillus in their growth in fluid media and as regards pathogenicity for animals.

According to Cushing, the colon bacillus is to be distinguished by its sluggish motility; its few flagella; its slight pathogenicity for man and animals; its abundant growth on potato; the absence of aerobic alkali production; its acidification and coagulation of milk; and the large amount of indol produced. Glucose and lactose are fermented with visible gas. The effect on sucrose varies.

The B. typhosus is to be distinguished by its active motility; its large number of flagella (up to fourteen); its marked pathogenicity for man and the lower animals; the slight acidification of milk, with little or no secondary alkalinity; the fermentation of glucose without visible gas; the absence of indol formation, or of any action on sucrose and lactose.

Durham[17] in a later paper gives a very elaborate classification of the various organisms under discussion. Gwyn's bacillus and the bacillus "O" of Cushing are placed in a separate group (group C), being distinguished from the B. enteritidis group for the following reasons: According to him, these organisms produce visible gas only when the other constituents of the media are favorable; they grow more like the typhoid bacillus than do the members of the enteritidis group; they produce acid in litmus whey, whereas the members of the enteritidis group produce acid followed by alkali formation. The sera of animals, immunized with the bacillus "O" and the bacillus of Gwyn, do not agglutinate the members of the enteritidis group.

*As will be seen later, Cushing obtained an indol reaction with both his own and Gwyn's bacilli, and we have obtained slight reactions with nearly all of the paracolon bacilli we examined.

I shall now give a brief summary of the organisms described in the cases of infection by members of the intermediate group, excluding those connected with the epidemics of meat poisoning and the cases of psittacosis.

All of the organisms described are typhoid- or colon-like in morphology, are decolorized by the Gram procedure, and do not fluidify gelatin. The organisms isolated by Achard and Bensaude produced no indol, did not ferment lactose nor sucrose, did not coagulate milk, and were not agglutinated by typhoidal serum. The authors state that the organisms simulated the B. psittacosis[18] very closely.

The organism isolated by Widal and Nobecourt is described as having properties like the bacillus isolated by Achard and Bensaude. These further data are given: It clouds bouillon without the production of a film; it produces visible gas in glucose; it ferments mannite, but not lactose nor sucrose; it grows as a yellowish-green film on potato and produces no indol; it does not coagulate milk. Widal and Nobecourt considered the organism to be closely allied to the B. psittacosis[18] and the B. of calf septicemia of Thomassen.[20] Widal and Nobecourt's organism is evidently closely related to our own.

The organism of Malherbe and Mounier[6] is simply described as producing no indol and not fermenting lactose—a description too brief to be of much service.

The organism of Gwyn, and Cushing's bacillus "O," resemble the bacillus from our case very closely. The only difference appears to be the later development of alkali in the milk cultures of their bacilli. The indol reaction was positive with their bacilli on the tenth day in sugar-free bouillon. On potato there was a slight yellowish growth after twenty-four hours; the potato was discolored after four days. On our potato tubes the growth was the same as with our organism, *i.e.*, it varied on different potatoes, showing again that the latter medium is of value only within certain limits.

Schottmueller describes his organisms as being divisible into two groups—two in one and four in the other. Both groups are facultative anaerobes and produce gas in ordinary agar (media not sugar-free?). None of the bacilli coagulate milk, but after a few weeks the milk becomes translucent. In litmus whey the organisms in the first set produce a slight amount of acid; those in the second do the same, but the acid is followed by alkali production. Indol is not formed by either group. The first group gives but a slight growth on po-

tato; the second a grayish-brown thick growth. No data are given as to their action on lactose and sucrose.

Through the kindness of Dr. Schottmueller and Dr. Norris I have been enabled to study one of each of the groups of Schottmueller's bacilli, the bacillus "Mueller" and the bacillus "Seeman." They both resemble our organism very closely. In litmus milk both produce acid followed by alkalinity; neither affects sucrose nor lactose. I obtained a slight indol reaction in sugar-free bouillon with the bacillus "Seeman" after eight days. (Schottmueller made his tests after four days.) On my potato tubes both of his organisms gave a slight whitish growth. According to Schottmueller, all of his organisms produced a greenish-yellow fluorescence in neutral-red agar after twenty-four hours.

Kurth's organisms are not completely described. They have numerous flagella; produce visible gas in glucose; produce no indol (tested after two days). Milk was coagulated after several weeks. The organism retained its virulence for a long time. According to Kurth, it was to be distinguished from the B. enteritidis because boiled cultures were not toxic, and because sera that reacted positively with his organisms gave no result with the B. enteritidis.

The organism isolated by Buxton and Coleman, according to some notes kindly sent to me by Dr. Coleman, and the examination of a culture kindly furnished by Dr. Buxton, is very closely related to the organism isolated by Schottmueller, Cushing, Gwyn, and myself, but differs in that even after six weeks there is no secondary alkali production in litmus milk. Gas is formed in glucose and maltose. Lactose and sucrose are not affected. Litmus whey becomes acid and cloudy. A slight indol reaction was obtained by me in ten days in sugar-free bouillon.

In this connection it may be of interest to refer to an organism isolated by Guarnieri and Vincent[22] in cases of acute yellow atrophy, at autopsy.* It was motile; grew less actively than the bacterium coli; produced indol; did not coagulate milk; fermented glucose rapidly, lactose and sucrose not at all; and acidified whey less than the bacterium coli. It was pathogenic for mice. Injected intraperitoneally into guinea-pigs it produced a septicemia with degeneration of the organs and marked changes in the liver. The organism was

*This organism, having been recovered post mortem, is, of course, of doubtful significance from an etiological standpoint.

termed the bacillus icterogenes. Similar organisms were found by Kruse and Pasquale[22] in the stools in cases of typhoid fever.

Note. In my own work I did not make any use of the scraped-tube test[23] mainly because Theobald Smith[24] considered the test of no great importance. Cushing's results, however, are of some interest in that he found that members of the intermediate group would not grow well on a substratum of any of the allies.

From this summary it is evident:

First. That the bacilli isolated by Schottmueller, Cushing, Gwyn, and myself are practically identical in cultural characteristics. Buxton's bacillus differs only in its action on milk.

Second. That the organisms of Achard and Bensaude, Widal and Nobecourt, and Guarnieri and Vincent probably are identical.

Third. That these organisms are all easily to be differentiated from the typhoid bacillus and the colon bacillus.

How closely Kurth's organism may be related it is difficult to state. I have had no opportunity of studying it.

Note.—Since writing the above Brion and Kayser have published a paper on a case of "paratyphoid infection" (*Münchener med. Wochenschrift*, April 15, 1902), in which they state that Kurth's bacilli closely resemble the bacillus "Seeman" of Schottmueller.

As regards the effects on animals, no extensive observations are reported regarding the members of this group. Achard states that three-fourths of a cubic centimetre of a bouillon culture of one of their paratyphoid bacilli killed a guinea-pig in less than twelve hours. No experiments were made with Gwyn's bacillus. Cushing states that the virulence of his bacillus "O" was like that of the B. typhosus. For further details I refer to his paper. I may state, however, that the serum of an animal immunized with his bacillus was possessed of no marked agglutinating power over other members of the intermediate group, but was possessed of a certain amount of protective immunity. Kurth's organisms were very virulent for guinea-pigs.

Quite a variety of names has been applied to the bacilli in the group under discussion. Achard and Bensaude called their organisms "paratyphoid bacilli." Schottmueller, without being cognizant of their work, used the same term. Widal and Nobecourt were opposed to this name, because they believed that the organisms resembled the colon bacillus more than the typhoid bacillus. Kurth called his organism the "bacillus gastricæ febricæ Bremensis." We have stated above that Cushing classified his own and Gwyn's bacilli as a

sub-group of the enteritidis group, and that Durham classified them separately.

As there is no definite arrangement as yet of the bacilli which possess some of the cultural characteristics of the colon bacillus and some of those of the typhoid bacillus, we believe that the choice of a name lies between the terms "paratyphoid" and "paracolon." The term "intermediate group" is apt to be misleading. Intermediate forms are apt to be found between other organisms.

There exists a number of organisms which are identical with the typhoid bacillus culturally, but differ from it in not being agglutinated by typhoidal serum.[7 22 47] We believe that the term "paratyphoid," if it be used at all, should be applied to such organisms.

We have left, then, only the term "paracolon" for the group of bacilli under discussion. We appreciate that the name is not a very good one and that the organisms are probably as independent of the bacterium coli commune as the latter is of the typhoid bacillus. Appropriate names for the organisms can hardly be forthcoming until the organisms in the typhoid-colon group can be properly classified.

Summary of Serum Reactions in the Reported Cases.

I have already referred to the reactions in the cases of Achard and Bensaude and to their lack of value. In the case of Widal and Nobecourt the reactions were as follows:

The serum of the patient agglutinated the paracolon bacillus in a dilution of one to one thousand. Colon bacilli were not affected. Another paracolon bacillus (their so-called "buccal" bacillus) was agglutinated in a dilution of one to one hundred and fifty; the B. psittacosis one to fifty; the bacillus of calf septicemia was not affected at all. Serum from an immunized guinea-pig gave no reaction with colon bacilli, the typhoid bacillus, nor the buccal paracolon bacillus. Various normal sera gave no reaction. Immune sera produced with other bacilli (colon bacilli, bacillus psittacosis, and the buccal paracolon bacillus) were all negative with their paracolon bacillus, excepting typhoid sera of very high agglutinative power. Fourteen typhoid sera, all having an agglutinative power of one to one thousand or less with the typhoid bacillus, did not affect their bacillus. An interesting experiment with one of the typhoid sera will be given later.

In Gwyn's case the serum reacted upon the isolated bacillus in a

dilution of one to two hundred. There was no reaction with the B. typhosus. Two colon bacilli were agglutinated at one to fifty and one to sixty, respectively, but normal sera affected them the same way. Typhoid sera did not affect the "Gwyn" bacillus.

In Cushing's case there was a positive reaction with the paracolon bacillus in a dilution of one to eight hundred after two hours. Typhoid serum and healthy sera gave no reaction. There was a reaction with an occasional variety of colon bacillus at one to fifty, but it was not marked. As mentioned above, he found no mutual serum reactions with the members of the intermediate group.

Schottmueller obtained reactions in very high dilutions in his case, but it is to be noted that he allowed three or four hours as the time limit of his reactions and did not regard the absolute cessation of motility as necessary for considering a reaction complete. The serum in his cases did not give any reaction with the B. typhosus, and typhoid serum gave no result with any of his organisms. The sera from his cases gave with their respective organisms reactions in dilutions varying from one to one hundred to one to ten thousand. The sera varied in their reactions with the bacilli recovered in the other cases. One serum reacted up to one to one hundred on all the organisms and on a colon bacillus. The second reacted on a number of the organisms and the colon bacillus. Upon the organism isolated from another case it reacted in a higher dilution than upon the organism found in the case. The serum of the third case reacted on the organisms from three other cases practically as well as on the organism isolated in the case. On two others it did not react at all, and it gave a reaction in a dilution of one to one hundred with an ordinary colon bacillus. The serum from the fourth case reacted on the bacilli from two other cases in dilutions up to one to one thousand and one to ten thousand, respectively, and in a dilution of one to fifty on two others. The fifth serum reacted markedly on three of the bacilli and only slightly upon two others. In the case of a physician who suffered from an attack of fever after having worked in the laboratory with one of the paracolon bacilli, no organism was recovered, but a positive reaction was obtained with three of the organisms in a dilution of one to one hundred. The serum from a case of infection by the bacterium coli affected none of the paracolon bacilli, but only homologous (that is, from the same case) and one heterologous colon bacillus.

In Kurth's cases, as noted above, he obtained two organisms and tested the sera of four cases. Positive reactions were found, varying

in the respective cases from one to two hundred up to one to eight thousand. The B. enteritidis and the B. typhosus were practically not affected by these sera.

The serum in the case reported by Buxton and Coleman agglutinated their bacillus in high dilutions, but was practically negative as regards the typhoid bacillus, Cushing's bacillus, and Gwyn's bacillus. Experiments with immune sera of animals gave the same results.

With regard to our own observations, we have already stated that we obtained no reactions with a number of the members of the intermediate group, whether we tested for an agglutination or for a thread reaction. The serum had already lost its power of affecting our own organism (the probable explanation of this will be given later), but still agglutinated the B. typhosus. We were unable to produce immune animal sera of high value on account of the accidental loss of our organism.

Summary.

It is very difficult to state exactly what we are to learn from all these results. The methods vary so much that it would hardly be proper to draw decisive conclusions. It can be stated in general terms, however, that the organisms in the various cases were agglutinated in high dilutions by the sera from the respective cases; that the organisms were not affected by typhoid sera, and the sera from the cases did not affect the typhoid bacillus. According to Schottmueller's data, even if we must accept them with some reserve, the serum from a given case may affect an organism from another case better than a homologous organism, and apparently similar paracolon bacilli are differently affected by the same serum. The fact that even with his liberal method of interpreting reactions some sera gave results in dilutions of only one to one hundred, shows that in some of these cases very low reactions only can be expected. The reactions in our case show the same. It is also to be noted that a serum which gives a reaction in high dilutions with the bacillus isolated from a case may give absolutely no reaction with an organism apparently very closely allied. Thus Cushing obtained hardly any reaction when he tested the serum from his own case with Gwyn's bacillus in a dilution of one to ten, although he obtained a reaction in a dilution of one to eight hundred with his own bacillus. Similarly, Durham[17] prepared a Gwyn serum which reacted in one to

twenty thousand with Gwyn's bacillus, but had no effect on Cushing's organism in a dilution of one to one hundred.

It is evident that the paracolon bacilli resemble the colon bacilli in their peculiar behavior toward the sera of infected persons, unless the various bacilli thus far found are to be regarded as separate species—an assumption hardly warranted at present.

Summary of our Case.

The clinical picture of our case resembled that of a cholecystitis or liver abscess. The Widal reaction was negative for several days and then became positive in a dilution of one to two hundred and fifty. The paracolon bacillus was found in the gall bladder, blood, and urine, and the blood gave a specific reaction with the various bacilli. Typhoid bacilli were not found at any time. At the autopsy healed and healing ulcers were found in the ileum. It is natural to suspect that we were dealing with a case of typhoid fever (of the ambulatory type) in which a secondary paracolon infection occurred, and in which a Widal reaction appeared after the typhoid infection had practically run its course. In such a case the probable portal of entry would be either the typhoidal ulcers or the bile duct. The main objections to such an assumption would be the following:

First. That the presence of the Widal reaction depended upon the personal equation which is always present as regards this reaction.

Second. That the case was an instance of a positive Widal reaction in a person not suffering from a typhoid infection.

Third. That the patient had had typhoid fever at some earlier time.

Fourth. That the jaundice accounted for the positive reaction.

Fifth. That the positive Widal reaction depended in some way upon the paracolon infection.

Ad 1. It is sufficient as regards this point to state that we never considered any reaction positive except when all motility had ceased and all the bacilli were agglutinated.[25] In this particular case the reactions were all instantaneous.

Ad 2. In an experience covering over one thousand cases of febrile diseases, we have never obtained a positive Widal reaction in cases that did not in one way or another prove to be instances of typhoid fever. In the cases reported in the literature in which reactions were

obtained without the presence of a typhoid infection, the reactions were usually present in low dilutions, and were generally found by those who obtained very high percentages of positive reactions in the typhoid cases and obtained them early. As Cabot[25] states, practically all of these observations are doubtful.

Ad 3. The reaction developed after it had been negative several days.

Ad 4. This criticism would depend upon the statements of Koehler,[26] who says that the blood of a jaundiced patient may give a positive Widal reaction, independent of any typhoid infection. In his five cases, however, the reactions only reached one to forty at the highest. When it is noted that he used sugar-bouillon cultures and considers clumps of four sufficient to term agglutinations, the results are of little significance. Our own experience with jaundiced patients speaks against the correctness of his views.

Ad 5. The main data which might be cited in this connection all refer to the occurrence of a reaction, with organisms in the intermediate group (Gaertner's and Nocard's bacilli) in supposed cases of typhoid fever.[16, 27] These cases, if they are not instances of a mixed infection, would have to be explained by the work of Pfaundler on group agglutination. This author found that in infections (particularly experimental ones) by a member of the colon group, a reaction was often present with other members of the colon group and the typhoid bacillus, but that the strength of the agglutination reaction with any of the latter organisms was less marked according to the degree to which the respective organism differed in cultural characteristics from the organism used for producing the infection. Widal and Sicard[30] have made similar observations.

The explanation of the positive Widal reaction in our case can hardly be made on the basis of its being a group-agglutination reaction, because the reaction against the typhoid bacillus was much more marked than the reaction against the paracolon bacillus. And the serum of one of the guinea-pigs inoculated with the paracolon bacillus gave a reaction against it in a dilution of one to fifty, but did not affect the B. typhosus. Furthermore, in none of the cases which I have cited in the introduction to this paper was there ever present a reaction with the typhoid bacillus. In the study of an epidemic of meat poisoning, made by Durham,[27] no reaction was found against the typhoid bacillus in any of the cases, although there were marked reactions with members of the Gaertner group of bacilli.

The occurrence of the lesions in the ileum in our case would also seem to point to the existence of a typhoid fever which had practically run its course before the patient came under observation. This statement cannot, however, be made with any degree of precision. As our own case is the first fatal one in the group, it is not known whether ulcers exist in the ileum or other parts of the intestine in these cases as they do in typhoid fever. Judging from some of the clinical histories (hemorrhage from the bowels), it is very possible. In other diseases caused by organisms of the intermediate group I am not aware of ulcers having been found. In psittacosis they have not been described.[31]

REMARKS ON MIXED INFECTIONS.

That there might be a secondary infection in typhoid fever by members of the colon group was seriously considered before the paracolon group was differentiated. Welch,[32] in 1891, considered that typhoid ulceration might open the way to an invasion by colon bacilli. Guinon,[33] Chantemesse and Widal,[34] Péré,[35] and others, found colon bacilli in cases of cystitis and pyelonephritis in typhoid fever. Neisser[36] brought up the question of mixed infections in 1893. Keen[48] cites a case reported by Klemm, of a bone abscess due to a colon bacillus supposed to be secondary to an attack of typhoid fever, but the bacteriological examination is quite incomplete, judged by present standards. Achard and Bensaude suspected that the case might be one of mixed infection. Stern and Biberstein[37] thought that it was probable that there often existed a secondary infection by members of the colon group in typhoid-fever cases, because they found especially high agglutination reactions with the colon bacilli in some atypical cases. Johnson and MacTaggart[38] from a study of serum reactions made the same suggestion. Cabot[28] states that Durham's observations suggest that what we call typhoid fever may be one of several infections, or a mixture of them.

In this connection the views of Meltzer,[39] recently published, are of interest. He reasons that because the reactions against the typhoid bacillus in cases of typhoid fever are so low compared with those obtained in infecting animals, and because the serum of typhoid cases also gives a reaction at times with one of the other organisms, there may exist mixed infections. He draws special attention to the possibility of mixed infections in which the typhoid bacillus is a second-

ary agent. In our own case, if it represents a mixed infection, as we are inclined to believe it does, the paracolon infection must have been secondary and the bacillus must have overgrown the typhoid bacillus. The abundance of the organism in the plates made from the blood made us feel positive that it would be impossible to find typhoid bacilli at the postmortem examination, even if they had been present in abundance before the secondary invasion occurred.

Cushing states that it is easy to understand the possibility, in fevers with intestinal lesions, of invasions by way of the portal circulation. But because it is unusual to find in lesions secondary to typhoid fever (excluding those occurring in the abdominal cavity) any organism except the B. typhosus or pyogenic cocci, he is inclined to believe that his case was not one of secondary invasion, but a pure paracolon infection. He claims to strengthen this argument by stating that if it were a case of mixed infection there should have been present a double agglutination reaction. But it must be observed that a number of months had elapsed since the supposed typhoid fever occurred, and the chances would be greatly in favor of a Widal reaction having disappeared in the interim, even if it had been present. Gwyn, in his case, suspected the occurrence of a mixed infection.

Widal and Nobecourt cite an interesting observation. The serum from a typhoid convalescent agglutinated their paracolon bacillus at a dilution of one to twelve thousand, and the typhoid bacillus at one to twenty. Eight days later it agglutinated the paracolon bacillus at one to twelve thousand and gave no reaction with the B. typhosus. It agglutinated another paracolon bacillus at a dilution of one to twenty and an ordinary colon bacillus at one to two hundred. At the height of the disease there had been a reaction with the typhoid bacillus at a dilution of one to one hundred, and no reaction with the paracolon bacillus. Widal and Nobecourt considered the case one of typhoid fever with a secondary paracolon infection. These are all the observations there are on record as to the possibility of mixed infections with the paracolon bacilli. It will be noted that our case is the most suggestive one so far reported.

REMARKS ON THE THREAD REACTION.

The occurrence of a thread reaction in the course of the serum tests in our case is of some interest, and we believe it is necessary to

make some reference here to the observations that have been recorded in connection with this phenomenon in the study of members of the colon group.

The subject was first prominently brought forward by Pfaundler,[49] although other observers had previously noted the phenomenon. Before Pfaundler, Achard showed that the blood of animals (guinea-pigs) acquired agglutinating properties against colon bacilli with great difficulty only. Achard, and Widal and Sicard, demonstrated that the reaction against a colon bacillus which had caused an infection in the human body occurred only exceptionally. Widal had shown that it is difficult to say when an agglutination reaction with a given colon bacillus is pathologic. Pfaundler investigated eight cases of (non-systemic) infection by colon bacilli (cases of cystitis, peritonitis, etc.). In each of these he obtained a positive reaction with the serum of the case and the respective bacillus at a dilution of at least one to one hundred, if the hanging-drop preparations were observed after twenty-four hours. In the febrile cases he obtained the thread reaction; in the others, a clump reaction. The thread reaction presented the following appearance:

The organisms were arranged in long, interwoven threads, the latter being generally coiled in skeins. The spaces between the skeins or threads were clear and none of the bacilli were motile. Very few single organisms or single groups of bacilli were found in the thread labyrinths. Upon observation with higher powers the organisms in the threads looked granular; some were club-shaped.* The bacteria could be demonstrated to be alive. The threads were best seen in the weakest dilution with which it was still possible to obtain a reaction. The threads usually appeared after a few hours. In most cases there was more or less agglutination at first. In Pfaundler's experiments he obtained positive reactions only when the patient's blood was tested with the organism causing the infection. He claimed, therefore, that the reaction represented more than a specific reaction, namely, an individualistic one. It is to be noted that the varieties of colon bacilli isolated from the cases varied very widely.

In some unpublished experiments made by the writer in 1898 it was found that the thread reaction was frequently obtained in cases of appendicitis and peritonitis due to the colon bacillus. Only colon bacilli which were closely allied in cultural characteristics were used.

*In our own experiments we always found the threads appear like chains of streptococci.

Fever was present in all of the cases. The general results of the observations were that the thread reactions occurring in a dilution of one to twenty, if the reactions were complete, seemed to be specific, and no interaction between the various bacilli and a given serum was found. The experiments were too few in number, however, to prove distinctly the absence of any interaction. (In cases of proteus infection interactions were found.) In some cases agglutination reactions only were found.

Krauss and Loew[41] obtained thread reactions with a number of organisms, with homologous and heterologous sera (that is to say, with the serum from the case from which the organism was isolated, and from other cases), and threw doubt on the claims of Pfaundler. However, their dilutions were in the main very low and the characteristics of the bacilli used in the experiments are not detailed.

Pfaundler[42] in a second paper attempted to show by means of animal experiments that the thread reactions obtained with a given serum and bacillus occur only as an individualistic reaction. He states that the reaction is practically not as useful as the agglutination reaction, as it is inconstant.

Krauss[43] in a second paper came to the following conclusions:

First. That thread formation is a phenomenon which occurs with certain organisms under the influence of an agglutinating serum.

Second. Agglutination always precedes it.

Third. It is not as constant as agglutination.

Fourth. In general, the same rules that apply practically for agglutination reactions apply for thread reactions, except as regards the bacterium coli.

He bases his conclusions on the occurrence of thread reactions with homologous and heterologous coli sera. He obtained the reaction with normal serum also, and says that it is therefore not specific. He concludes, however, that threads and agglutinations usually occur in specific dilutions and with the use of a homologous serum and a homologous colon bacillus. It is to be noted, however, that a study of Krauss' experiments shows that most of his tests were made with low dilutions. Only once did he obtain a thread reaction at a dilution of one to fifty with a normal horse serum and a heterologous colon bacillus. It is questionable how much value such an experiment has as regards reactions in the human body. It was only with the use of a homologous serum and a homologous colon bacillus that he obtained the thread action in a high dilution (one to two hundred).

The reactions in our own case which have led up to this discussion were briefly as follows:

The organism obtained from the gall bladder was affected at a dilution of one to one hundred on September 5, but on September 7, when the blood acted upon the bacillus isolated from the blood at a dilution of one to one hundred, the gall-bladder bacillus (which was identical with the blood bacillus) was affected at a dilution of one to twenty only, and then not completely. On September 8 the reaction with the gall-bladder bacillus was quite imperfect, and the reaction against the blood bacillus was present only at a dilution of one to fifty and not as perfectly as before. On September 9 the results were about the same.

It was found that the sera of patients suffering from colon infections, which gave a good reaction with their own colon bacillus, did not affect our bacilli, nor did our serum affect colon bacilli from a number of cases of cholecystitis, appendicitis, and enteritis, and from the intestine of the patient. After September 9, because of the pressure of work, we recorded reactions only at a dilution of one to twenty, and at this dilution we obtained thread reactions with all the bacilli isolated from the patient, for a number of days. After several months the same serum which was preserved sterile did not affect our organism. In this set of experiments agglutination did not precede the thread formation. All the organisms were involved in the reaction. Only occasionally did the threads persist for twenty-four hours; usually they were replaced by clumping, partial or complete, or the field was full of vibrating bacilli. The reactions were usually most pronounced after three or four hours.

The reactions obtained on September 7 are particularly interesting, because the bacillus from the gall bladder was much less affected than it had been the day before, whereas the bacillus obtained from the blood gave a reaction at as high a dilution as the bacillus isolated from the gall bladder had given. Pfaundler observed that colon bacilli, when grown outside of the body, lose their power of being affected by the serum from the case, and adds this as an argument in favor of the individualistic character of the reaction.

We found, a few years ago, that the same serum and the same organism no longer gave a thread reaction after a number of days, if the organism was transplanted daily. The length of time varied for different organisms. It seemed to us also that the loss of the reaction seemed to be due to the artificial cultivation of the bacillus and

not to a loss of power of the conserved serum. Further observations are needed on this point.

Flexner,[44] Kruse, and Duval and Vedder[45] have noted the occurrence of the thread reaction with an organism more closely allied culturally to the typhoid bacillus than to the colon bacillus, namely, the dysentery bacillus. In their observations, however, it would appear that the thread reaction was of the same significance as the agglutination reaction.

It is important, we believe, to have this subject further investigated, to ascertain to what extent agglutination reactions are to be depended upon for diagnostic purposes in cases of infection by colon and paracolon bacilli, and whether the thread reaction is of the same or of more value than the agglutination reaction.

Our case demonstrates that it is necessary, in studying cases of infection by paracolon bacilli, to make tests for thread reactions as well as for agglutination reactions.

According to our experiments, thread reactions are best obtained by making an emulsion in bouillon of a culture of the organism with agar. The suspension must be a very dilute one, just enough of the culture being used to cause a distinct cloudiness; usually two loopfuls of culture suspended in ten cubic centimetres of bouillon will suffice. Our dilutions were usually made with normal saline solution.

GENERAL REMARKS ON THE SERUM DIAGNOSIS OF PARACOLON INFECTIONS.

From all that has been stated regarding the reactions in the recorded cases, and the general remarks concerning serum reactions in the colon group, it is evident that it would be better for the present not to make an absolute diagnosis of a paracolon infection on the basis of the serum reactions alone. There seem to exist the same difficulties concerning the rules of agglutination as exist with the ordinary colon group.[46] It is important, at any rate, for the practitioner to know that there do not exist the same comparatively simple conditions as regards serum reactions as there do for the bacillus typhosus in cases of typhoid fever. A striking example of this is given by Durham,[17] who found that two colon bacilli differing materially in cultural characteristics were agglutinated by the same serum, one at a dilution of one to fifty thousand, and the other at a dilution of one to thirty thousand. The serum had been obtained by immunizing an animal with the second bacillus.

If possible, the diagnosis of a paracolon infection should, for the present, rest on the recovery of a bacillus of the group, preferably from the blood or the urine.

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THE CULTURAL CHARACTERISTICS OF THE MENINGOCOCCUS AND MICROCOCCUS CATARRHALIS.[1]

By H. L. Celler, M.D.,
HOUSE PHYSICIAN.

During the past five years we have had the opportunity of investigating at the laboratory of Mount Sinai Hospital about twenty cultures of the diplococcus intracellularis of Weichselbaum. A review of the literature on this subject demonstrates that considerable confusion concerning the characteristics of this organism exists. Our results, on the other hand, with the exception of slight and unimportant variations, have been constant and agree in all essentials with those of Weichselbaum and his assistants.[2]

Morphologically the meningococcus appears as a diplococcus, the contiguous sides of the individual members being flattened and separated by a fine line of division appearing as an unstained area under the microscope. There is a marked tendency to form tetrads, but the chain formation described by Heubner, Jaeger, and others we have never seen. It is common to find great variations in the size of the individual cocci, large forms appearing next to small ones, especially in older cultures. All of our cultures were invariably decolorized by Gram's solution; we have never met with the non-decolorizing form of Heubner. The organism shows no capsule.

Growth on agar is not constant. Some of the cultures grew upon this medium at first but later lost this power, while others showed a gradually increasing profuse growth, and could readily be kept alive by transplanting to fresh tubes at intervals of a few days. The addition of human serum—ascitic, pleural, or hydrocele—to the agar always gave better results, but the most luxuriant growth was obtained upon the medium devised by Dr. Libman, serum-agar plus glucose one-half to two per cent. Maximum growth was obtained with the

[1]Meeting of New York Pathological Society, December, 1902.

[2]Ghon and Albrecht, Wiener medizinische Wochenschrift, 1901, p. 984.

higher percentage of glucose. With the addition of still higher percentages of glucose (three, four, five per cent.), as well as with the use of lactose or saccharose (two per cent.), the development of the organism was neither furthered nor hindered. [More recent studies of our own seem to indicate that lactose is favorable to the growth of the organism (not as favorable as glucose), while saccharose does not favor it at all.] On Löffler's serum there is an abundant growth. On glycerin-agar the growth varies, usually only a few fine colonies being obtained; but on the addition of serum the growth is profuse.

In fluid media the organism grows characteristically. The growth begins as a diffuse cloudiness near the surface, that after two or three days forms a white scum on the surface. The remainder of the medium is at first clear, later slightly clouded, while at the bottom of the tube there is a flocculer sediment. There is considerable difficulty in obtaining growth in this form, as the shaking of the tube will prevent the formation of the scum or cause it to break up and fall to the bottom after it has formed.

The majority of our cultures have grown slightly in ordinary bouillon with and without the addition of sugar in the form of glucose, lactose, or saccharose. Some, however, have only grown upon the addition of serum, the sugar in these cases having apparently little advantageous effect. There is no gas formation in these media in Smith fermentation tubes, in which growth is confined to the bulbs.

In litmus-milk we have been able to demonstrate growth. The milk is not coagulated and there is no evident acidity production. On gelatin there is no growth at room temperature.

On potato the results have varied. Sometimes there is no growth, while at others there is a delicate film on the surface that is seen with difficulty, or can only be demonstrated by spreads made by scraping the surface of the medium.

Anaerobically there is no growth.

Almost identical morphologically with the meningococcus, but differing from it culturally, is another organism found in normal and in some pathological conditions on mucous membranes of the respiratory tract, in the eye, the ear, and occasionally in the urethra. This is the micrococcus catarrhalis of Pfeiffer.

In spreads this organism also appears as a diplococcus, with some flattening of the adjacent sides of the individual cocci. It decolorizes with Gram's solution. There is no capsule. In all its characteristics

it bears so close a resemblance to the gonococcus that it can be differentiated therefrom under the microscope only with great difficulty. The tetrads formed by meningococcus as well as the large forms already described will sometimes, however, serve to differentiate this from the other two organisms. Further, the individuals of the micrococcus catarrhalis are more nearly oval than those of either the gonococcus or meningococcus.

On agar the micrococcus catarrhalis grows profusely, even in the first generations, herein differing from both the meningococcus and gonococcus, that show no growth or very slight growth on this medium. The use of glycerin or serum-agar, Löffler's serum, or Libman's serum media affords no particular advantage. In fluid media the scum formation already described is readily obtained if the cultures are not disturbed. The membrane lacks, however, the homogeneity of that formed by the meningococcus, being composed of dry, granular clumps floating on the surface. In the variation in the cloudiness of the medium, as well as in the flocculär sediment, the two organisms are identical. There is no gas formation in glucose, lactose, or saccharose bouillon in fermentation tubes; growth is confined to the bulb. Unlike the meningococcus, acid production in glucose and saccharose bouillon is demonstrable.

In litmus-milk there is growth without coagulation or acidity production. On gelatin there is no growth at room temperature, but Ghon reports slight growth after five or six days under proper thermal conditions. On potato, growth is fairly luxuriant, older cultures appearing yellowish brown; the water remains clear. Anaerobically there is no growth.

On plates the meningococcus and micrococcus catarrhalis are readily differentiated. The superficial colonies of the former are light brown in color; there is no nucleus, but at the centre are large clumps that gradually diminish in size toward the periphery. The outer zone is finely granular and paler in color. The edge is sharply defined, circular, and regular. There is a very close similarity between these colonies and those of the gonococcus. The colonies of the micrococcus catarrhalis are dark brown in color, lighter at the periphery. The older colonies show a distinct dark nucleus, the remainder of the colony being finely granular. The edge is sharply defined and circular, but differs from that of the meningococcus in being irregular as though gnawed. Macroscopically the nucleus of the colonies of micrococcus catarrhalis and the white lacquered surface, as compared

with the absence of nucleus and the grayish-white surface of meningococcus colonies, will serve to distinguish between these two organisms.

A most important means of differentiation is furnished by the nature of the growth both on slants of solid media and on plates. On the former the meningococcus presents a shining, grayish, moist growth that is viscid, stringy, and readily scraped from the surface. The growth of the micrococcus catarrhalis, on the other hand, is white, dry, crumbly like mortar, and adheres to the surface of the medium. Sometimes the entire growth may be removed as a membrane. On plates the same differences are seen. The viscidity of the meningococcus colonies stands in marked contrast to the dryness of the colonies of micrococcus catarrhalis, that slide along the surface of the medium without breaking up. These points have been brought out by Ghon and Albrecht.[3]

It is impossible to enter here fully into the further questions of the influence of titre on growth, and of pathogenicity. Regarding the latter, our results agree with those of other investigators. Our experiments have been limited to inoculations into white mice, guinea-pigs, and rabbits. Subcutaneously both organisms are without effect. In a small proportion of cases intraperitoneal and intrapleural inoculations of either meningococcus or micrococcus catarrhalis in mice and in guinea-pigs have been fatal. Autopsy shows a serofibrinous peritoneal and a hemorrhagic pleural exudate. A splenic tumor may or may not be present. All the viscera show hyperæmia and degeneration. The organism may be recovered from the exudates and sometimes from the blood and spleen. The virulence of the micrococcus catarrhalis is far less marked than that of the meningococcus. Larger animals are less susceptible. In rabbits, however, intravenous (Ghon, Weichselbaum) and intracranial (Weichselbaum) inoculations of the meningococcus have proved fatal. Injections into the meninges of goats with the production of meningitis have been unsuccessfully carried on both by Heubner and by Councilman, Mallory, and Wright.

[3] Zeitschrift für klin. Medizin, Bd. xliv.

REMARKS ON THE MENINGOCOCCUS AND ON ITS RELATIONSHIP TO THE GONOCOCCUS AND MICROCOCCUS CATARRHALIS.

By E. Libman, M.D.

In connection with the paper by Dr. Celler, I should like to make some remarks on my experience with the meningococcus, particularly with the idea of attempting to throw some light on the questions in dispute. During the past five years I have had the opportunity of studying bacteriologically over one hundred cases of meningitis. In most of these the fluid obtained by lumbar puncture *intra vitam* was examined; in a few, examinations were made at autopsy only. In these cases I have had the following results:

Tubercular cases	44
Streptococcus cases	17
Pneumococcus cases	6
Staphylococcus aureus cases	3
Pseudo-influenza bacillus cases	1
Proteus vulgaris cases	1
Bacillus pyocyaneus cases	1
Diplococcus meningitidis cases	20

In a few cases streptococci and a variety of bacilli were found; the last could not be grown aerobically. I suspect that these were anaerobes, particularly as all these cases were secondary to mastoid disease. These cases occurred in all the services of the hospital; a few are cases in the private practice of other physicians and myself (The larger number of cases due to the meningococcus occurred in Dr. Koplik's service.)

I wish now to state our opinions on several mooted points, based on a study of these cases. I shall be very brief, as I hope to report on these data in full on another occasion.

1. As to the relationship of the pneumococcus and the meningococcus from an epidemiological standpoint. All our pneumococcus cases were secondary. Observations recorded in the literature would seem to indicate that the pneumococcus can cause epidemic meningitis. Of course most of these reports were made at a time when the organisms under discussion were much confused. Further observations are necessary. It is to be noted that any pathogenic organism may produce a meningitis as the only evidence of a systemic sepsis; and

an organism may cause a meningitis by first causing an otitis media or a small area of pneumonia. If the primary disease leads in a short time to a meningeal inflammation, the case clinically corresponds to a primary meningitis. One of our pneumococcus cases was characterized by an acute meningitis following within less than twenty-four hours an apparently mild otitis media without pus production.

2. There are on record descriptions of a number of varieties of the meningococcus (Heubner, Jaeger, and others). Some correspond to what Weichselbaum described. Others differ in holding the Gram stain, in the profuseness of their growth on ordinary agar and bouillon, or in their growth on gelatin media, etc. All our cultures corresponded to those described by Weichselbaum. None of them ever showed Gram-positive diplococci. There is a variation in the growth on media not containing serum; but when we obtained growth on these media it was never profuse. We only once obtained a growth (very slight) on gelatin at room temperature, and hardly any or none on potato in the incubator. According to our experience, then, there is but one type of the diplococcus meningitidis in the New York cases of cerebrospinal meningitis. Councilman and Wright found the same in Boston, Osler and Hirsch in Baltimore, and Herrick and others in Chicago. We are inclined to believe that there is but one type of organism at play in the European cases. The description of other varieties we believe to be due to one of three causes:

(a) Variations in the use of the Gram stain.

(b) Use of other methods for differential staining. (For instance, Heubner uses a Gram-Weigert stain.)

(c) The occurrence of skin contaminations (staphylococci).

3. If it were not for a statement in Leube's book on diagnosis (last edition), it would hardly be necessary to point out that the pneumococcus should not be confused with the meningococcus. Leube says that animal experiments are necessary for the identification of these organisms. However, if it be granted that the meningococcus does not hold the Gram stain, we have a fundamental difference. Furthermore, the pneumococcus is lancet-shaped, has a capsule, diffusely clouds bouillon, grows much less profusely than the meningococcus in serum media, etc.

4. As to the occurrence of the meningococcus in the nose and throat, we have made no extensive observations. We found several years ago that other diplococci occur in the nose and throat which resemble the meningococcus morphologically and in staining reactions. In one

case, reported by Dr. Koplik in the *Medical News* of last year, we found the meningococcus (proved culturally) in a conjunctival inflammation which was followed by a fatal attack of meningitis. The meningococcus was repeatedly found in the cerebrospinal fluid.

5. The micrococcus catarrhalis is an important organism, not only because of the undoubted confusion it has caused with regard to the meningococcus, but also because it can be so easily mistaken for the gonococcus if cultures are not made. I have repeatedly seen it in cultures from the throat and in sputum, and once in otitis media. It has been found in the urethra, and probably in the conjunctival sac. The cultures of the micrococcus catarrhalis which we have studied correspond to those which Ghon and Albrecht describe.[1] I am convinced that this is but one of a group of closely allied organisms. Dr. Celler has detailed sufficiently how easily it is to be distinguished from the meningococcus.

6. Dr. Celler's remarks have also indicated how the meningococcus can at times closely resemble the gonococcus culturally. It is important to differentiate the organisms carefully. This is true not only from a mere technical standpoint, but also because the question may arise clinically. Thus, Fränkel has described meningococcus-like organisms in conjunctivitis. Fürbringer reported a case in which a cerebrospinal meningitis occurred in a patient with gonorrhea. The meningococcus was found in the puncture fluid and apparently (cultures not made) the gonococcus in the urethral discharge. Furthermore, there are reported two cases in which the meningococcus was found in the blood; in one, long before symptoms of meningitis were manifest. In such cases as this last, careful methods should be used before the identity of the organism is established. We would lay special stress on these points:

A. The occurrence of tetrads and the irregularity in size and staining reactions of the meningococcus.

B. The profuse growth of the meningococcus in Löffler's serum and the absence of any growth of the gonococcus on this medium. Some claim to have seen a slight growth of the gonococcus.

C. We never obtained growths of the gonococcus on agar. At times the meningococcus grows on agar. Some writers have noted slight growths of the gonococcus on agar. In any event a good growth on agar speaks against the gonococcus.

[1] Zeitschrift für klinische Medizin, Bd. xliv.

In serum-bouillon media and serum-glucose-bouillon media the two organisms grow practically in the same way. I have repeatedly noted that the growth of the gonococcus in fluid media, if the observations are carefully made, is on top of the fluid in the form of a white scum. This feature of the gonococcus has, as far as I have been able to determine, never before been described. I hope to go into this subject in a later paper dealing with the biology of the gonococcus.

7. None of the three organisms under discussion causes precipitation in any of my serum-sugar media. According to our experience staphylococci always precipitate in two per cent. glucose-serum-agar. By the use of this medium the occurrence of the confusion of staphylococci with meningococci, which Ghon and Albrecht suspected in some of the reported observations, can be avoided.[5]

8. As to the frequency of finding the meningococcus in cases of cerebrospinal meningitis—we have studied thirty cultures in twenty cases—in some, repeated examinations were made. In all the cases we found the diplococci in spreads or in cultures. In the first seven cases we failed to obtain the organism culturally in one. In the last seventeen cases we always succeeded in obtaining cultural results. These seventeen cases were studied by the aid of the serum-glucose media. At times the organisms are found in spreads at first and not later. Cultures may be positive first and negative later. We believe the diagnosis can always be established if the examinations are made early. In cases of long standing, cultures and spreads might be found negative.

Ghon reports twenty-two positive results in thirty cases (but some fluids were sent from a distance). Osler found the cocci in spreads or in culture twenty-seven times in thirty cases. Councilman, Mallory, and Wright examined puncture fluids in fifty-five cases. The diplococcus was found in spreads or in cultures in thirty-eight. Gradwohl (St. Louis) describes cultures which can hardly be considered as being those of the meningococcus.

9. We obtained results with small amounts of fluid when we used the two per cent. serum-glucose-agar. We usually poured one-half to one cubic centimetre of fluid into a tube of the medium. Twice a day the condensation fluid and added fluid were allowed to flow over the surface of the medium (Heubner's method). It often required forty-eight hours for a result. Once it required seventy-two hours.

[5]Recently I have seen two cultures of the meningococcus which precipitate very slightly.

The occurrence of a growth of a Gram-negative diplococcus which shows no or but slight growth on agar, no growth on gelatin nor on potato nor on bouillon in twenty-four hours, which causes no change in litmus-milk in the same time, and which grows profusely on Löffler's medium, is sufficient, according to our present knowledge, to make the presence of the meningococcus a certainty.

These final remarks hold true provided media of certain titres are used. From our experiences we would say that the media not containing serum should be neutral or, better, slightly alkaline to phenolphthaleïn. The serum media should be made from agar which is one-half or one per cent. acid. The subject of titre is of extreme interest with regard to the meningococcus and gonococcus. We hope to report further on this aspect of the subject.

[*Contributions from the Pathological Department—F. S. Mandlebaum, M.D., Pathologist.*]

A CASE OF INFECTION OF THE EPIDIDYMIS AND TUNICA VAGINALIS BY THE FRIEDLAENDER BACILLUS.[1]

By Eugene P. Bernstein, M.D.,
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Although the literature abounds in observations of infections by the Friedlaender bacillus, the number of cases arising in the genito-urinary tract is very small. The occurrence of the organism in the respiratory tract, as a causative factor in pneumonia, pleurisy, and empyema, is well known, and its etiological significance in certain cases of otitis media, meningitis, cholecystitis, and intestinal infection has been established.

Etienne, in an exhaustive article comprising eighty-three cases collected from the literature, describes instances of primary infection in almost every organ of the body. In the genitourinary tract he describes lesions secondary to a septicemia.

In the cases reported by Canon, Clairmont, Brunner, Weichselbaum, Howard, and Josserand and Bonnet, the Friedlaender bacillus was isolated from the kidneys and in two cases from the urine, but these cases were not instances of primary infection. Montt-Saavedro gives a short account of two cases of cystitis, and Shenk describes a case of bilateral salpingo-oöphoritis, due to the bacillus.

Of more interest are the cases of Halban, Malgaigne and Vauverts, and Chiari. In Halban's case a scrotal hematocele became infected and from the pus the Friedlaender bacillus was obtained in pure culture. The mode of infection could not be ascertained. Malgaigne and Vauverts found the same organism in both spermatic cords and the urethra in an infection subsequent to an acute specific urethritis. In Chiari's case some doubt exists as to the primary seat of infection.

[1]Reprinted from the American Journal of the Medical Sciences, 1903.

He concludes from a study of his case that the cystitis was the cause of an ascending suppurative pyelonephritis followed by a fatal septicemia.

When we consider that these few observations represent all that has hitherto been seen in the way of infections of the genitourinary tract by the Friedlaender bacillus, the following case becomes one of decided interest:

History (abstract). The patient, a male 58 years of age, was admitted into the Mount Sinai Hospital on July 6, 1902, under the care of Dr. A. A. Berg, to whose kindness I am indebted for the clinical history.

Family history negative.

Previous History. Gonorrhea at the age of 22 and pneumonia at the age of 51.

The present history is of three weeks' duration. At that time his right testicle suddenly became swollen, red, and tender. One week later the left testicle was similarly affected, while the inflammation of the right diminished somewhat in severity. He claims to have had no chills or fever. Urination and sexual power normal. There are no other facts of importance.

Physical Examination. The right testicle is hard, and swollen to about one and a half times its normal size; it is not very tender, nor is there any fluctuation present. The right spermatic cord is distinctly thickened.

The left testicle is of the size of a large orange and is very tender. The skin over it is glossy and reddened. The consistence of the tumor mass is hard, except at the lower anterior portion, where fluctuation can be felt distinctly. The left spermatic cord is of the thickness of the index finger. There is no urethral discharge. Rectal examination reveals nothing but a slight prostatic hypertrophy. On massaging the seminal vesicles a few drops of purulent-looking secretion appear at the meatus. On examination gonococci are not found to be present.

The operation, which consisted of incision and drainage of the left tunica vaginalis, revealed the following conditions: The tunica vaginalis is much thickened and filled with a very viscid, yellowish pus. The epididymis is the site of numerous small abscesses. The testicle appears to be normal. Spreads from the pus show a Gram-negative encapsulated bacillus. The cultures will be described later.

Five days after the operation the right testicle began to increase in size, became tender, and showed distinct fluctuation. The seminal vesicles also became much indurated and tender. Aspiration of the right tunica vaginalis yielded the same viscid, yellowish pus.

At the second operation the right tunica vaginalis was incised and drained. A large pelvic abscess was found on the left side. This was evacuated by an incision just above the left Poupart's ligament and a

counter-incision was made in the perineum. About fourteen ounces of non-odorous, yellowish pus were evacuated. The left spermatic cord was also incised, and pus, similar to that previously described, was obtained. It is unnecessary to go into the further clinical history of the case, except to state that the patient made an uneventful recovery. The urine, which contained many pus cells and a few granular casts, was not examined bacteriologically. The finding of the Friedlaender bacillus in it could not have been of much significance, as it might have been infected from the epididymis.

Bacteriological Examination.—The findings in the pus obtained at the different operations are all identical. The organism is a non-motile, facultative anaerobe. Spores and flagella cannot be demonstrated.

The spreads show a rather short, plump, Gram-negative bacillus with rounded ends, surrounded by a broad capsule, which is well demonstrated by the ordinary methods for staining capsules (Welch and Weichselbaum) and by the writer's modified Gram stain, which is very well adapted for the demonstration of capsules.[2] There is a tendency here and there for the organism to grow in short chains. There is no decided variation in the size of the organisms.

Agar Plates.—Macroscopically the superficial colonies are more or less rounded in shape, well elevated above the surface, and show a sharply defined edge. They are rather grayish-white in color, mucoid in appearance, the surface being glossy. The deeper colonies are small, round or oval, pale yellow or yellowish-gray in color.

On microscopic examination the superficial colonies are of a yellowish-gray color, almost opaque in the centre and more transparent toward the periphery. The edge is regular and well defined, and the colony as a whole is of a homogeneous structure. The deep colonies are round or oval, of a deep brown color, with a distinct edge. The colony is finely granular and quite opaque.

Surface inoculations on agar show considerable growth in the form of rather diffuse mucoid colonies, which adhere rather tenaciously to each other, being drawn into long threads when an attempt is made to remove some of the colonies with a platinum loop.

Stick Cultures in agar show the growth along the entire puncture, with a diffuse, thick growth over the surface.

Gelatine stick cultures: Growth along the entire puncture and diffuse growth on the surface; no gas formation or liquefaction of medium.

Bouillon: Diffuse marked cloudiness with slight sediment at the bottom of the tube. Considerable scum on the surface.

[2]The writer's method is as follows: After fixing the specimen, it is stained with anilin-water-gentian-violet for thirty seconds; the Gram solution is then used for twenty seconds; alcohol until complete decolorization ensues. The specimen is washed in water and is then counter-stained for fifty seconds with a twelve per cent. aqueous solution of fuchsin (made from a saturated alcoholic solution).

Glucose-agar stick cultures: Numerous gas bubbles within six hours.

Glucose-bouillon (one-half per cent.) and saccharose-bouillon (one-half per cent.): Diffuse cloudiness; slight sediment; no scum formation; distinct acid production in twelve hours.

Lactose-bouillon (one-half per cent.): Growth less marked.

Fermentation Tubes.—Glucose-bouillon: Growth in the branch and in the bulb; acid production marked; gas formation.

Saccharose-bouillon: Growth in the branch and bulb; very marked acid production; more than twice as much gas formation as in the glucose medium.

Lactose-bouillon: No growth in the branch; slight growth in the bulb, with alkalinity production. (All stock bouillon sugar-free. Lactose, saccharose, and glucose media contain one-half per cent. of the respective sugars.)

Milk: Distinct acid production; no coagulation even after thirty days.

Indol: Moderate reaction on the fourth, fifth, sixth, and seventh days; more marked on the eighth day.

Potato: Heavy, prominent, yellowish-gray mucoid growth; gas bubbles on the surface.

Serum-agar: Very marked growth—more abundant than with ordinary agar. No precipitation; no gas formation.

On the *sugar-serum-agars* (devised by Libman) there is a very heavy growth. Precipitation on the glucose and saccharose media with gas production, but none on the lactose media.

Serum Reactions.—The patient's blood gave no reaction with the organism, either in the form of threads or of clumps, when tested in weak and strong dilution.

Animal Experiments.—Intravenous and intraperitoneal inoculations into rabbits were without apparent effect. Guinea-pigs invariably succumbed within twenty-four hours after intraperitoneal injection, and a very marked general peritonitis, from which the organism was recovered, was always found.

It is evident, from the description which precedes, that the organism found in our case is a typical Friedlaender bacillus. It is of interest to note that the organism is more active in splitting up saccharose than it is in splitting up glucose, and that lactose is not at all affected. It has been our experience in the laboratory that this property is quite characteristic of a number of members of the Friedlaender group. The presence of a positive indol reaction is in accord with the work of the later investigators. The absence of agglutination or thread formation in the serum test is a rather striking phenomenon in so marked an infection. The point of invasion of the organism remained undiscovered. The moderate severity of the case clinically was in striking contrast to the severity of the infectious process.

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REPORT OF THE X-RAY DEPARTMENT.

By Walter M. Brickner, M.D.,
RADIOGRAPHIST,
AND
Eugene Eising, M.D.,
ASSISTANT RADIOGRAPHIST.

In August, 1901, the x ray laboratory was made a separate department of the hospital, and its sphere was enlarged to include the study of all cases referred to it from the various wards, from the accident service and the admitting room, and from all the departments of the dispensary. The number of cases for fluoroscopic and skiagraphic diagnosis, and the rapidly increasing number of cases for x-ray treatment, became so large that it was soon necessary to secure the services of an associate in the laboratory. From all this material the department has accumulated a valuable collection of negatives and an interesting record of the results of x-ray therapy in a variety of conditions.

It is perhaps worthy of note that of the very large number of cases submitted to x-ray examination, not one has, to our knowledge, suffered the slightest "burn."

It has been our experience, verified again and again, that the best pictures are secured by using tubes regulated to a very low vacuum, and it is our common practice to make skiagraphs with tubes emitting a little *blue light*. In this way we have best been able to secure the differentiation of bone structure and the shadows of tissues of less density *(e.g.*, muscles and ligaments).

It is difficult to estimate the percentage of accuracy in our reports on the presence or absence of renal calculi, since many cases reported negatively have not since been operated upon. On the other hand, it is noteworthy that *all cases that have been studied on the operating or the postmortem table have verified our x-ray findings, positive or negative.* Two cases are of interest to report:

W. B., a physician, patient of Dr. Lilienthal, suffered from severe attacks of what appeared to be renal colic, located sometimes on the right side and sometimes on the left. Six plates were exposed on three different occasions. All showed distinctly the shadows of the kidneys; all failed to show the presence of a calculus. The patient was discharged from the hospital and resumed his professional labors. A few months later (during which time, it may be said, he did not pass a stone) he returned with a virulent sepsis from an infection contracted while performing an autopsy. From this he died. At necropsy the kidneys, ureters, and bladder were found free of stone.

The second case illustrates at once the value and the limitation of radiography in the study of calculi.

From a radiograph of S. M., a patient of Dr. Lilienthal, the department made a report of the presence of *two stones, or of one stone with two nuclei, near the upper pole of the left kidney.* Exactly in this location there was found upon operation a dumbbell-shaped calculus of considerable density. But, in addition, scattered through the parenchyma of the organ were four masses of soft calculous material of which the radiograph had given no indication.

Our results with x-ray therapy have been "encouraging," but not such as to warrant great enthusiasm. The few cases of lupus treated have been extremely slow in reaction in our hands, and none has as yet been cured.[1]

A case of sarcoma of the ovary progressed to death in spite of persistent treatment.

An ulcerating scirrhus carcinoma of the breast, involving the ribs, has diminished in size considerably. Still under treatment.

Lenticular carcinoma of both breasts of two years' standing. Disappearance of many nodules. Marked improvement. Still under treatment.

Carcinoma of tongue with marked glandular involvement. Six treatments. Great relief from pain the first week. No effect the second week.

Epitheliomata of long standing and slow growth have responded

[1]Since the writing of this report several new cases have been treated in our department. Among these should be mentioned here: a rebellious lupus of the nose, of twelve years' standing, completely healed after fourteen treatments; extensive sycosis of the face of twenty years' standing much improved by one treatment and cured after a few more; recurrent sarcoma of cervical glands, involving the thyroid, reduced in size by half in two months—still under treatment.

most satisfactorily to treatment. A few cases may be briefly referred to:

Multiple epithelioma of face (no microscopical examination); ten years' duration; small. Nine treatments in thirteen days; total exposure, one hour and forty-seven minutes. Complete disappearance without scarring. No recurrence after ten months.

Epithelioma, size of a pea, involving entire thickness of margin of lower eyelid. Complete disappearance of growth, leaving a pin-head-sized, pearly white spot (epithelial pile?) on the conjunctival margin of lid.

Epithelioma of wing of nose, size of half-dollar; six years' duration; has resisted all other treatment. Ulceration promptly healed under x-rays. Lower border of growth still present after seven months of intermittent treatment.

Extensive epitheliomatous ulceration of forehead of twelve years' duration. Has tendency to spontaneous healing in some spots and breaking down in others. Prompt response to x-rays. Ulcers entirely healed in two months. A few small, waxy elevations remain (pronounced epithelioma after microscopical examination). Patient, satisfied with healing, unwilling to return for further treatment.

Epithelioma of inner canthus of left eye; thirteen years' duration. Raw surface of ulcer covered with apparently normal epithelium after twelve exposures. Still under treatment.

X-ray treatment was a complete failure in the following two interesting cases, in which favorable results might have been expected:

M. J., aged 38 years, U. S., salesman. April 3, 1902: Under mucous membrane of right cheek is a hard, irregular, somewhat tender mass. The mucous membrane over it is pink-white and unbroken. There is no attachment to skin or bone, but the cheek is slightly swollen. No glandular enlargements. Complains of pain, limitation of movements of jaw, inability to eat coarse food. The thickening is of about twelve months' duration. Six months ago, section removed for microscopical examination and reported non-malignant and non-specific. The wound thus made healed promptly. Has had specific treatment without effect.

During April, 1902, eleven x-ray exposures were made, of duration increasing from five to twenty minutes. The irradiation was through a Ferguson china speculum passed through an opening in a lead screen and inserted in the mouth, its oval extremity abutting against the affected area. The correctness of the application of the rays was verified by means of the fluoroscope applied to the cheek. Beyond a relief of pain after the first few treatments, there was no result. During the month of May x-ray treatment was discontinued and large doses of potassium iodide were again exhibited—also without

result. Meanwhile the mass was growing, and the cheek became involved externally. Pain and contracture increased.

May 30: External carotid artery on right side tied by Dr. Lilienthal. Sections from cheek and from a now enlarged submaxillary gland reported epithelioma.

June 11: Wounds healed. Growth spreading. Wide area on cheek and neck exposed to x-rays ten to fifteen minutes daily.

June 14: Left external carotid artery tied.

June 18-30: Growth progressing rapidly. Exposures made twice daily, fifteen to twenty-five minutes each, without any effect whatever other than production of slight erythema.

June 30: Patient discontinued treatment.

November: Growth has extended steadily and ulcerated deeply, exxposing inferior maxilla. Died.

REPORT OF A CASE OF CARCINOMA OF THE FOREHEAD, TREATED BY THE ROENTGEN RAY, ILLUSTRATING SOME OF THE PECULIARITIES OF THE ACTION OF THIS AGENT

By Eugene H. Eising, M.D.

A. S., female, aged 70 years; Bohemian. Usual history of persistent scabbing ulcer of forehead over right eye. Frequent attempts had been made to encourage healing by cauterization and medicaments. In the course of nine months a large tumor about 6 cm. in transverse and 4 cm. in vertical diameter had developed, and at the point of maximum elevation appeared an ulcerated area about the size of a fifty-cent piece. At this time the patient was referred to us from the dispensary service of Dr. W. H. Luckett for treatment by means of the Roentgen ray. A small piece of the tumor was removed for microscopical examination.

The patient was submitted to Roentgen ray exposure to the point of tolerance, and at the expense of a rather severe burn, in order to eradicate the disease. For five weeks the tumor showed no reaction whatever to the rays, and treatment by this method was about to be discontinued when suddenly rapid shrinkage began. Treatment was then continued daily, and the exposures gradually increased to twenty-five and thirty minutes for two months, at the end of which time the tumor had entirely vanished. The ulcer, however, persisted and the surrounding skin was severely burned. After cessation of further treatment the ulcer healed kindly in the course of two weeks.

Although the patient had been advised not to consider herself cured and to place herself under further treatment, she remained

away one month. Upon her return a tumor had again developed at the same site and had reached approximately the dimensions of a hen's egg, diffuse in outline, and thoroughly adherent to the underlying periosteum. Above and to the outer side two smaller nodules had also made their appearance. This recurrence—if, in fact, we may consider it such—was extremely painful, both spontaneously and to the touch. Pain was very much increased by exposure to the Roentgen ray, and after three weeks of treatment patient refused further aid, although the tumor had already begun to show reaction.

The patient remained away for two and a half months, during which time she had sought aid at another hospital, returning to us at the end of this time emaciated, cachectic, and with symptoms indicating cerebral involvement. Death supervened one month later.

This case demonstrates what has been termed the cumulative property of the x ray. The term cumulative seems to be improperly applied to a process of necrobiosis, which this, in the light of recent investigation, seems to be. However, there was no apparent reaction in this case until after five weeks of almost daily treatment, when suddenly the tumor mass began to shrink, and continued to do so even after the interruption of further exposure to the ray, showing that this retrograde metabolism instituted by the action of the Roentgen ray continues for a time after having once been put into action.

Another peculiarity is that the ulcer which was present when treatment was begun, and for many months previous to that time, refused to heal. It showed a decided tendency to repair soon after the retrograde metabolism became evident in the tumor mass, but failed to heal during the two months of steady treatment, closing promptly, however, in about two weeks after cessation of treatment. This demonstrates the fact, corroborated by further experience, that whereas the Roentgen ray exercises a deleterious influence on aberrant growth of epithelial tissue, it disturbs also, but perhaps to a less degree, the function of normal tissue repair.

REPORT OF ANESTHESIAS—1901.

By Truman Abbe, M.D.,

HOUSE SURGEON.

General Surgical Service:	
Division 1	509
Division 2	564
Gynecological Service	304
Eye and Ear Service	170
Total	1,547

General Service:	Division 1.	Division 2.
Gas and ether	264	296
Chloroform	121	146
Ether	13	23
Gas	22	25
Gas and oxygen	..	1
Ethyl chloride	3	7
Schleich general	1	2
Gas and ether to chloroform	20	13
Chloroform to ether	15	10
Local:		
Cocaine, 2 per cent	5	2
" 4 per cent	9	7
" 6 per cent	1	1
Eucaine, 2 per cent	2	..
" 3 per cent	2	1
" 4 per cent	3	..
" 6 per cent	24	23
Failure of local and change to general	4	7
Total	509	564

Gynecological Service:	
Gas and ether	238
Chloroform	28
Ether	20
Gas	8
Schleich general	3
Gas and ether to chloroform	2
Chloroform to ether	4
Eucaine, 6 per cent	1
Total	304

Eye and Ear Service:	
Gas and ether	52
Ether	54
Chloroform	8
Chloroform to ether	4

Local:	
Cocaine, 4 per cent	20
" 5 per cent	17
" 10 per cent	3
Holocaine, 1 per cent	8
" " cocaine, 4 per cent	2
Eucaine, 4 per cent	2
Total	170

REPORT OF ANESTHESIAS—1902.

By M. L. Maduro, M.D.

AND

M. P. Denton, M.D.

ANESTHETISTS TO MOUNT SINAI HOSPITAL.

General Surgical Service:	
Division 1	524
Division 2	592
Gynecological Service	388
Eye and Ear Service	190
Total	1,679

General Service:	Division 1.	Division 2.
Gas and ether	374	362
Chloroform	81	140
Gas	23	39
Gas and oxygen	1	1
Anestol	..	1
Gas and ether to chloroform	10	10
Chloroform to ether	7	9
Local:		
Subarachnoid, cocaine	1	..
Cocaine, 2 per cent	..	1
" 4 per cent	10	5
" 6 per cent	2	..
" 10 per cent	4	..
Eucaine, 4 per cent	..	4
" 6 per cent	5	5
Schleich infiltration	6	15
Total	524	592

Gynecological Service:	
Gas and ether	318
Chloroform	19
Gas	22
Gas and oxygen	1
Gas and ether to chloroform	11
Chloroform to ether	13
Local:	
Cocaine, 4 per cent	3
Schleich	1
Total	388

Eye and Ear Service:	
Gas and ether	102
Chloroform	30
Gas and oxygen	1
Gas and ether to chloroform	3
Local:	
Cocaine, 4 per cent	18
" 5 per cent	13
" 10 per cent	10
Holocaine, 1 per cent	10
Eucaine, 4 per cent	3
Total	190

Introduction.—The anesthetists went on duty as instructors of anesthetics to the House Staff of Mount Sinai Hospital on June 1, 1902. Their duties are as follows:

1. Each to be on duty six months of the year.

2. To instruct the incoming House Staff in the principles and administration of the various general anesthetics.

3. To be at call during their respective services, to administer anesthetics to such ward and private patients as the surgeon may desire.

Ether versus Gas and Ether.—A comparison with the last report shows a distinct step forward in the abandonment of the use of ether *per se*, and in its universal application in combination with nitrous oxide gas for deep narcosis. As administered by Bennett's apparatus it is possible to overcome the primary intoxication of ether and to rapidly plunge the patient into deep anesthesia. It was previously impossible to avoid all unpleasant sensations at the beginning of the inhalation, owing to the pungent and disagreeable odor of ether. Under the old method struggling was a factor that was a great inconvenience, requiring two to four men to control the patient, besides being a danger to subjects who presented diseases of the heart or arteries, or who were enfeebled either from long-standing disease or some recently acquired and prostrating sickness. The modern apparatus, although costly, distinctly adds to the safety of the narcosis in the relatively smaller quantity of ether one is called upon to use. We therefore recommend the routine use of nitrous oxide gas and ether, unless special contraindications present themselves.

Chloroform.—The percentages of cases anesthetized with chloroform have been somewhat smaller this year than last, as a glance at the statistics above will show. While chloroform distinctly has a narrower zone of safety, it cannot be said that its use is dangerous in the

trained hand. We must recognize the clinical fact that during all forms of general anesthesia intercurrent conditions will arise from time to time, seriously complicating the ordinary phenomena of narcosis; and it is the proper appreciation and anticipation of these circumstances that lessen the risk and that gain for the anesthetist the deserved confidence of his surroundings. Our observations on a large number of chloroform anesthesias, confirming as they do physiological experiments by others, have demonstrated to us the value of a practice we have been following, of administering to the patient, some minutes before operation, a hypodermatic injection of caffeine, two to five grains. In this way the initial fall of blood pressure, due to vasomotor depression and cardiac dilatation, is avoided. Caffeine,

FIG. 1.—Maduro's modification of Hewitt's apparatus.

besides acting on the heart muscle, is a powerful respiratory stimulant and increases the urinary flow. We have occasionally been called upon to administer chloroform for certain operations around the nose and mouth where the ordinary methods would not avail. Although our experience is so far limited, we have obtained encouraging results with a specially devised apparatus suggested by Hewitt, of London, and shown in the accompanying illustration.

The method of administration is as follows: After the patient is chloroformed in the usual manner to the full degree, the combination gag and tube is inserted between the last molar teeth of one side, and the vapor of chloroform is pumped by a hand atomizer through the tube from a bottle containing the narcotic. The pumping should be more or less rhythmical—we will say, about fifteen times to the

minute. The gag and tube are especially desirable in antrum operations, or in nose cases where it is necessary to have the mouth open in order to sponge out blood from the pharynx. The other tubes are useful to pass back to the pharynx in resection of the jaw, or to replace tracheotomy in amputation of the tongue. While anesthesia can be maintained by this method in any general surgical operation, it is only advised in the above special cases, where it is of advantage to have the anesthetist's apparatus out of the field of operation. This little instrument may be considered unsafe because of its novelty, but the fact is, there is no safe appliance for the administration of chloroform. The key to safety is to be found in a careful study of the effects produced in each individual case, and not in any hard-and-fast rule of procedure.

Anesthetic Mixtures.—We have studiously avoided the use of any of the recognized mixtures, except on one occasion when anestol (ethyl chloride one part, chloroform two parts, ether three parts) was given to an infant, two days old, to relieve the condition of imperforate rectum. It was selected here on account of its rapid elimination. Our main objection to mixtures is based on the fact that as the separate ingredients have different rates of evaporation, they are inhaled separately, thereby complicating anesthesia; it being almost impossible to ascribe untoward results to any definite vapor and to meet such a condition by intelligent treatment. It is true that in certain patients a mixture of anesthetics is indicated. This class can be benefited by a change or sequence rather than a definite mixture of the narcotics. It is therefore a fallacy to consider mixtures as definite stable bodies capable of yielding definite vapors, such as Schleich claims. His theory of the relation of the body temperature to the boiling point of the narcotic is, however, one that deserves further investigation.

Nitrous Oxide Gas.—We have administered this gas oftener this year than last. While its absolute safety compared with other anesthetics makes its use in minor surgery advantageous, we suggest that its use in rectal operations should be abandoned. Operations of this type require profound anesthesia, owing to the rich nerve supply of these parts and the presence of exaggerated sensibility on the part of the patient. We have used gas in prolonged operations (ten to twenty minutes) in enfeebled subjects, without bad results. From a surgical point of view gas is not a satisfactory anesthetic on account

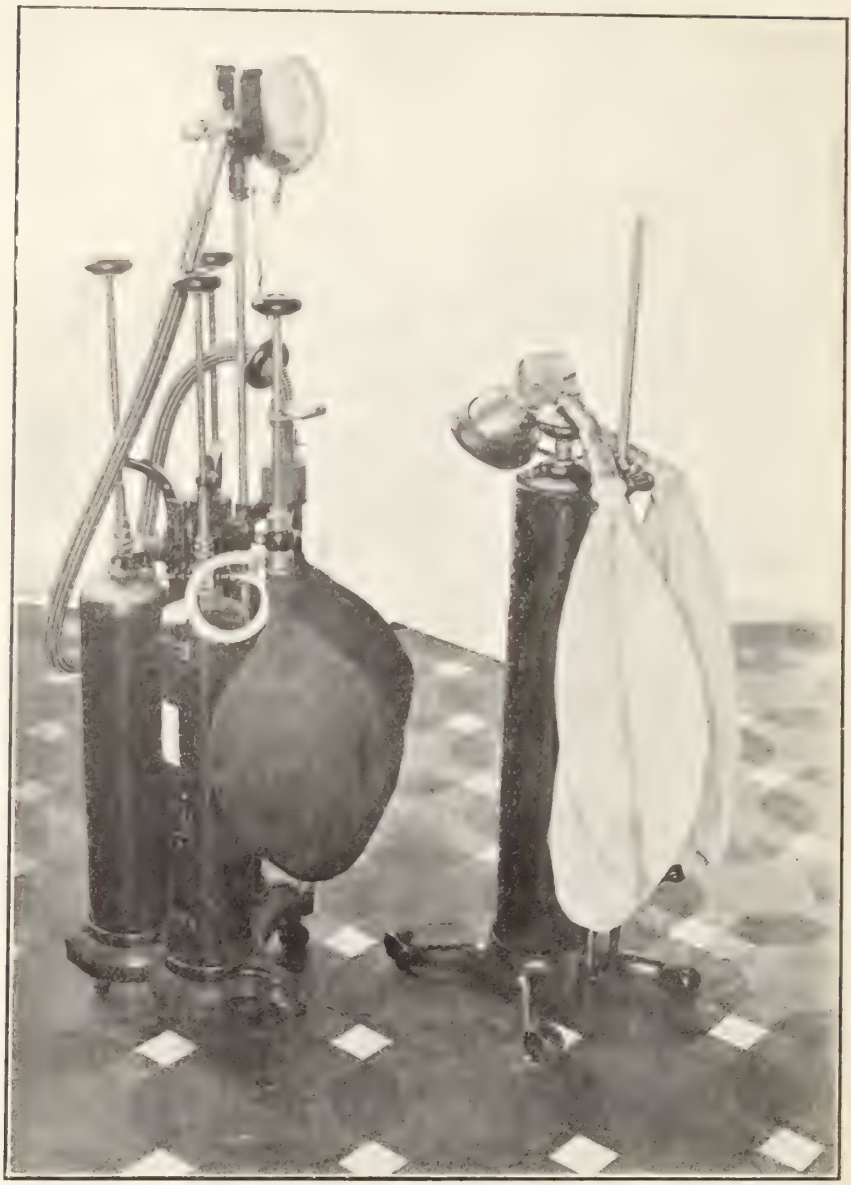
of the attendant asphyxia. We now eliminate the asphyctic element by administering

Nitrous Oxide Gas with Definite Percentages of Oxygen.—An instrument for giving this agent is shown in the accompanying illustration (Fig. 2).

The method of administration: The bags are moderately filled with their respective gases, the face-piece accurately applied, and the patient is instructed to breathe deeply in and out through the mouth. When it is noted by the action of the valves that proper breathing is maintained, two per cent. of oxygen is admitted at the same time that nitrous oxide is turned on full. The oxygen indicator is increased one per cent. with every three breaths until four to eight per cent. is admitted, the amount depending on the need of the patient to maintain a tranquil anesthesia. When conjunctival reflex is lost, the arms flaccid, and breathing is regular, we judge anesthesia to be present. In administering this anesthetic the type of patient must be carefully considered, the best subjects being anemic women or the enfeebled. To attempt to narcotize the robust, obese, or alcoholic individual by this method would mean certain failure. Our experience has so far been very limited, for we have only possessed the apparatus since August, 1902.

Anesthesia Records.—On July 1, 1902, the hospital, at our suggestion, adopted a record sheet embodying all important facts relating to anesthesia. Herein the anesthetizer records the condition of pulse, respiration, reflexes, pupils, the occurrence of vomiting and cyanosis, the administration of drugs before and during, urinalysis before and after, the amount of anesthetic used and the length of operation, also final remarks relative to the behavior of the patient under the narcosis. This sheet is later incorporated with the history of the patient. The value of this record is obvious; for not only is it an important matter for future reference when accurately kept, but it impresses the anesthetizer as a self-aid to careful observation.

Post-operative Pneumonia.—This is a most important subject, that should stimulate us to further research as to its causation in view of its prevalence in hospitals as a direct result especially of the inhalation of ether. Pneumonia has been seen to follow the inhalation of chloroform, but it is a rare occurrence. Our records show a larger percentage of ether-pneumonias during 1901 than 1902, accounted for, no doubt, by the fact that we have profited by experience. While the larger number of ether-pneumonias have been of the bronchial type



S. S. White Gas and O_2 apparatus.

Bennett's attachment for Gas and O_2.

FIG. 2.

and have recovered, there have been two cases of the lobar type followed by death. It would be rather empirical to state that, just because ether-pneumonia is usually of the bronchial type, we should seek other causes for death when lobar pneumonia follows the inhalation of ether, for we are of the opinion that it is possible for direct infection with the diplococcus pneumoniæ to take place from the rebreathed air of a rubber bag in which some other patient has previously rebreathed, especially when the second patient's resistance is low, intensified by the refrigeration and congestion of the lungs resulting from the inhalation of cold ether vapor. The different or combined factors entering into the causation of post-operative pneumonia we can sum up as due to: 1. Refrigeration from inhalation of the anesthetic (ether). 2. Refrigeration from exposure of the patient during or after the operation. 3. Direct infection from rebreathing into unclean rubber bags.

The inhalation of large volumes of cold ether vapor by the susceptible individual may of itself excite a local catarrh, followed by bronchopneumonia if there is interference with the free escape of catarrhal products. Prolonged operations and undue concentration of vapor naturally increase the risk. The stimulating and irritant effect of ether on the respiratory, circulatory, and glandular systems should make us careful, in those susceptible, to allow free drainage of mucus from the mouth and change the anesthetic to chloroform. Sufficient stress cannot be placed on the importance of avoiding exposure, and maintaining the body heat of a patient narcotized, by the liberal use of warm blankets at all seasons of the year. To avoid infection by rebreathing into rubber bags previously used on other patients, we instituted during the summer of 1902 the practice of boiling the bags for five minutes in live steam. If properly attended to there is no reason why it should shorten the life of the bag. We are also careful to restrict the method of rebreathing to very short intervals during inhalation.

Renal complications after ether are usually spoken of as frequent, but our observations, though limited, urge us to express the opposite opinion. Experiments in the physiological laboratory are not always borne out in actual practice. The diminution in the quantity of urine passed in twenty-four hours after anesthesia with ether is seen also after the use of chloroform, and can be attributed to purgation and starvation before operation.

General anesthesia in diabetics has concerned us specially in two

cases, where no bad results followed a careful narcosis. Inasmuch as coma is due to an increased amount of acids in the blood, it is not necessary to try to reduce the percentage of sugar in the urine by a strict antidiabetic diet, for such a regimen tends to increased acidosis. When there are evidences of increased acidosis in the urine of diabetics, the patient is permitted to have a mixed diet, also five to ten grammes of sodium bicarbonate before and after the anesthesia.

Drugs and their Uses in General Anesthesia.—When not to use them is a most important knowledge to us. Of all drugs likely to be useful in the treatment of collapse from other conditions, experience proves few to be indicated in the collapse of anesthesia. We should recognize the cause and degree of collapse at the same time that we institute treatment. The major forms of collapse should be treated by precordial compression (especially in children), by artificial respiration, adrenalin, oxygen, and intravenous infusion of normal saline fluid. The minor forms of respiratory collapse are often due to falling of the tongue, impinging on the epiglottis and obstructing the air-way. We can attest to the value of the two-pronged volsella in relieving this condition by making rhythmical traction on the tongue at the rate of eighteen a minute. In respiratory difficulties previous to operation, such as in asthmatics, 1-150 grain of atropine administered hypodermatically at that time is of great aid. Strychnia, 1-30 grain, is invaluable in mild forms of circulatory failure. Morphine is not recommended for routine use. It is of advantage in the excitable, in nose and throat surgery of a major character, for prolonging the action of general anesthetics, in cerebrospinal surgery where hemorrhage is lessened, and in patients addicted to the morphine habit. In all such cases one-fourth grain of morphine administered just before the inhalation is indicated. Adrenalin, five drops of a 1:1000 solution dropped on the tongue, proved of value in circulatory collapse in a child operated on for appendicitis abscess. The life of the child was certainly saved by this agent; nevertheless its use is still *sub judice* and not to be advocated as a routine measure. Brisk lip-rubbing with a dry towel is a useful aid to minor difficulties in circulatory depression.

Shock in its Relation to Anesthesia.—We have been asked sometimes to decide whether the operation should continue. So long as the pulse can be counted at the wrist it is safe to continue, provided no time is lost in stimulating the patient with saline enemas, etc. As a rule the anesthetic plays a small part in the production of shock

during narcosis, except in those cases in which too light or too deep anesthesia has been obtained. The symptoms of shock are usually produced by the length or nature of the operation, and also where considerable hemorrhage has taken place. From the anesthetist's standpoint the proper course in avoiding shock is to be guided by the patient's condition, maintaining as deep a narcosis as it is safe to induce, and continuing with a lighter degree as the operation proceeds. In minor cases of shock resulting in temporary reflex cardiac inhibition, stopping the anesthetic and changing to another narcotic will often suffice as a measure to restore the patient.

Paralysis of Nerves.—Within the experience of the last year this infrequent post-operative complication of anesthesia has not been recorded, due, no doubt, to the care in avoiding faulty positions of the arms. Although usually of a transient character, the paralysis can be prevented by placing the arms in a natural position and taking care not to drag them over the head or compress them against the trunk.

Impurities in Anesthetics.—Our attention has been recently called to the unnecessary amount of ether used in the hospital to secure and maintain deep narcosis. We have had to use an average of six ounces within an hour, whereas we were using three ounces outside the hospital in the same time. We concluded that there was sufficient cause for complaint in the hospital system of decanting ether from a five-pound can into a twelve-ounce stock bottle, requiring it to be poured out again by the anesthetist into an eight-ounce bottle for immediate use. It was obvious that if we could prevent decanting and use the ether directly from the smallest can furnished by the manufacturer, the problem would be readily solved by using less and avoiding impurities. Our views were corroborated by the manufacturer, who cited the experience of two other large hospitals that had adopted the plan of administering ether from an original package containing four ounces. On the strength of the foregoing we have just concluded a month's trial (December, 1902) of the new method, with the result of a saving of three pounds (forty-eight ounces) in comparison with a previous average month under the old method. While the cost, pound for pound, is greater with the new system for the trial period of a month, yet we feel no hesitancy in stating that the amount used will so regulate itself within a year as to mean a saving in expenditure within that time.

One death on the table from chloroform occurred within the year.

This case was to have been operated on for exophthalmic goitre, and died after the incision was made. Status lymphaticus was found on autopsy. Overdosage never plays the important part in the causation of these tragic deaths in the operating room of the hospital that it does in the physiological laboratory. Some unrecognized asphyctic state caused by the presence of chloroform in the blood and the deterioration of its oxygen-bearing corpuscles, assisted by cardiac dilatation, seems to be a proper conjecture to account for these fatalities on the operating table. While it is true, as previously reported in our records, that respiration generally ceases before cardiac action fails, it is the want of heart action which is the factor in the causation of chloroform deaths.

Local anesthesia in the general surgical service has been made use of in such operations as herniotomies, colostomies, and gastrostomies. A number of such operations begun by this method have been finished under general anesthesia.

We are happy to say that subarachnoid cocainization has been performed but once within the last two years. The dangers attendant on the use of this method have influenced our surgeons to consider it as still in the experimental stage of development.

Ophthalmic operations performed under general anesthesia have frequently called for discussions as to the relative value of ether and chloroform. Whereas ether is safer in the untrained hand, chloroform has its advantages in so far that a cumbersome apparatus is out of the way, that a smoother narcosis is obtainable, and that the depth of anesthesia can be graded to a nicety. Removal of adenoid vegetations may best be performed under gas and ether, the gas being mixed with indefinite percentages of air in order to reduce the attendant asphyxia to the minimum as well as to diminish the risk and annoyance of free hemorrhage during the operation. Narcosis should be obtained to the full degree before operating, in order that there may be no necessity to reapply the mask.

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